

Appendix A

Addendum and Supplement to Permit Applications



May 1, 2007

Tennessee Department of Environment and Conservation
Division of Water Pollution Control
6th Floor, L&C Annex
401 Church Street
Nashville, TN 37243-1534
Attn: Mr. Mike Lee

U.S. Army Corps of Engineers
Nashville District
3701 Bell Road
Nashville, TN 37214
Attention: Mr. J. Ruben Hernandez

Tennessee Valley Authority
Cherokee-Douglas Watershed Team
3726 E. Morris Blvd.
Morristown, TN 37813
Attention: Ms. Karen Stewart

SUBJECT: ADDENDUM TO PERMIT APPLICATIONS
Former Jake Thomas Farm Applications
Pigeon Forge, Tennessee
S&ME Project Nos. 1434-05-679, 329 and 329A

Dear Karen, Mike and Ruben:

S&ME is providing the enclosed information on behalf of the City of Pigeon Forge and Riverwalk Park, LLC. The purpose of this correspondence is to document the proceeds of a meeting held on April 26, 2007, at the Tennessee Department of Environment and Conservation (TDEC) in Nashville, Tennessee. The meeting was organized and attended by Mr. Paul Sloan, Deputy Commissioner of TDEC, Earlene Teaster, City Manager of Pigeon Forge, and Michael McCall of Pigeon Falls Leisure Land Company, LLC (PFLLC). Representatives from several consultants involved in the project were also in attendance, along with Paul Davis, Dan Eagar, and Mike Lee of the TDEC Division of Water Pollution Control (DWPC). A list of the meeting attendees is attached and included as part of this meeting documentation package.

The meeting was organized to introduce Pigeon Forge representatives to Mr. Andy Reese of AMEC, and Ms. Judith Webb of the U.S. Green Building Council. Mr. Reese and Ms. Webb presented information on low impact development and green building benefits, respectively. Following their presentations, Mr. Michael McCall and the supporting consultants presented

02 MAY 2007

information on the Pigeon Forge development proposed for the former Jake Thomas farm. The presentation focused on measures that the City of Pigeon Forge (the City) and PFLLC have considered in their respective development plans to address water quality issues.

Some of the slides used in Mr. McCall's presentation are attached to this addendum, documenting the proposed water quality management techniques considered. As discussed during the presentation, and as shown on the attachments to this document, both the City and PFLLC have committed to incorporate water quality treatment methods that go beyond what is routinely required in East Tennessee, in an effort to provide a development that will be a showcase for the community and the state.

On behalf of the City, Gresham Smith and Partners (GSP) has provided a preliminary design for a collection system that will address stormwater runoff from the majority of the two proposed new roads (Pigeon Falls Lane and the Jake Thomas Road extension). In addition, a portion of the existing Teaster Lane will also be retrofitted with this collection system during the proposed road improvements, thus further reducing runoff during storm events. As shown on Figure 1, attached, the proposed system will collect runoff from the previously mentioned roads and transfer it to a subsurface treatment system to be located on the City's portion of the terrace area. GSP has provided information on a Stormtech® subsurface stormwater management system that will allow infiltration of stormwater on the terrace area, thereby reducing stormwater runoff from the proposed road network (Figures 2-4, attached).

In addition to the proposed subsurface stormwater management system for road runoff, the City has also committed to using pervious pavement in their proposed parking areas. As shown on Figure 5, attached, GSP has proposed a system that includes grading the parking areas to drain toward eight-foot pervious concrete strips underlain by a perforated pipe bedded in gravel. These pervious pavement strips would collect stormwater runoff and facilitate infiltration for up to a 10-year storm. This process substantially decreases stormwater runoff from the proposed development.

Mr. Norm Johnson of Waterfield Design, on behalf of PFLLC, presented several opportunities for water quality management on the proposed Pigeon Falls Village development (Figure 6). The treatment methods discussed fell into three primary categories, presented below:

Pervious Pavement in Parking Areas : PFLLC has committed to using pervious pavement in their proposed parking area for the lodge to be located at the intersection of Jake Thomas Road and Teaster Lane, and for the parking areas in Main Street Marketplace and the West Terrace development, as shown on Figure 1. The pervious pavement will utilize the methods previously discussed for the City's parking areas (Figure 5).

Biologically Filtered Stream and Associated Drainageway System: A more substantial water quality structure incorporated in the proposed Pigeon Falls Village development will be centered on the drainageway located on the eastern side of this parcel (Figure 7, attached). In this area, PFLLC has committed to constructing a closed-loop, biologically-filtered waterfall and stream system intended to simulate a Smoky Mountain stream (Figures 8, 9, and 10, attached). In addition to the habitat this feature will provide, this stream system will be underlain by a vertically isolated water filtration layer fitted with infiltration chambers (Figures 11 and 12, attached). This layer will serve to collect site runoff, providing treatment of the water and reducing the volume of stormwater runoff leaving the site. Both of these two distinct layers will be underlain by a separate, vertically isolated collection system designed to collect existing surface water discharge that currently supports the existing stream flow. As mentioned during the meeting, S&ME has been monitoring flow from this stream over the past few months, and average flow rates from this stream have been 0.012 cubic feet per second (cfs) during base flow conditions. As discussed during the meeting and shown on the attached schematics, the proposed stream system to be constructed in this drainageway will support a significantly larger flow rate, supplied by fresh and recirculated groundwater. Chlorinated municipal water will not be used as a water source for this proposed stream feature.

Potential Onsite Water Quality Treatment Options: The opportunities for onsite water quality management in Pigeon Falls Village include pervious pavement, both in pedestrian and vehicular traffic areas, green roofs, storm water vaults, bioswales, rain gardens, infiltration chambers, water quality structures, rain barrels and/or cisterns (Figure 6, attached). As discussed, these techniques will be employed as practicable throughout Pigeon Falls Village to reduce the water quality impacts of the proposed development.

At the conclusion of the April 26, 2007 meeting, Mr. Mike Lee of TDEC DWPC requested additional information on the project during a discussion with Ms. Liz Porter of S&ME. The following items were discussed:

1. Mr. Lee requested information on the proposed percent of impervious area on the Pigeon Falls Village site, along with an estimate of the area directed to bioretention features. In response to this request, Mr. Norm Johnson of Waterfield Design has provided preliminary estimates that on the 4.4 million square-foot site, approximately 40 percent would be impervious building and paved areas. Under the scenario presented in our meeting, in excess of 50% of the impervious areas may potentially be directed to bioretention features and other subsurface stormwater quality management features.
2. Mr. Lee also questioned whether the proposed impact to the stream in the vicinity of Pigeon Falls Lane would be french drained in a manner comparable to the methods discussed in the meeting for the Pigeon Falls Village stream. GSP has provided a design to TDEC (Knoxville Environmental Assistance Center) as part of the Storm Water Pollution Prevention Plan (SWPPP) showing a french drain system for this stream that segregates stream flow from the stormwater management system.
3. Mr. Lee asked whether native species would be used for landscaping purposes. Since the overall project plan is to celebrate the Great Smoky Mountains, the applicants are committed to using native species representative of the region.
4. Mr. Lee questioned what effect the proposed stormwater treatment systems might have on metals that might be found in stormwater runoff, and also questioned the plans for discharge from these systems. Mr. Lee is interested in minimizing direct discharge into the river. As stated previously, the proposed stormwater management system would collect stormwater runoff and facilitate infiltration for up to a 10-year storm, substantially decreasing stormwater runoff from the proposed development. Metals from vehicular traffic, grit or other development-related sources would likely primarily adhere to the sediment load. Since metals in the stormwater would likely primarily be transported as part of the sediment load, settling of total suspended solids in the stormwater systems would provide a reduction in metals as well. Infiltration will be a primary treatment method for stormwater management. Related to this issue, Mr. Lee asked if it might be feasible to create a wetland in the floodway and discharge stormwater runoff to this feature. Although the City can look at this option to see if it has merit, there are two issues that would potentially limit the feasibility of this idea. In order to create a wetland, the floodway would either need to have fill material placed to create a retention area for stormwater runoff, or a retention area would need to be excavated. In the first scenario, the placement of fill in the floodway would require coordination with the Federal Emergency Management Agency (FEMA), and a possible no-rise certification supported

by the appropriate hydrologic modeling. In the second scenario, excavation in the floodway would require additional archaeological surveys and coordination with archaeologists from the State Historic Preservation Office, TVA, and the U.S. Army Corps of Engineers. Both of these scenarios potentially result in additional permitting efforts that may not be feasible if either flood storage or archaeological issues exist. Although a constructed wetland in this area may not be possible, GSP will attempt to direct overflow from the stormwater systems into other proposed wetland areas, level spreaders, or other discharge structures intended to reduce point-source discharge into the river.

The issues addressed in the presentation and documented herein have been beneficial in demonstrating to TDEC the level of commitment regarding water quality issues for the project. As discussed during the meeting, the City and PFLLC have put forth considerable effort over the past several years to address the complex issues posed by the proposed development. To date, the following permit applications have been submitted by S&ME on behalf of the City, Riverwalk Park LLC, and Pigeon Falls LLC:

1. *Corps, TDEC and TVA Individual Permit Applications, Main Street Marketplace*, dated October 31, 2005 (for Riverwalk Park, LLC)
2. *Revisions to Corps, TDEC and TVA Permit Applications, West Terrace, (Formerly Main Street Marketplace)*, dated March 29, 2006 (Replaced submittal No. 1, for Riverwalk, LLC).
3. *Corps, TDEC and TVA Individual Permit Applications, Pigeon Falls Village*, dated July 28, 2006 (for Pigeon Falls, LLC)
4. *Corps, TDEC and TVA Permit Applications, Pigeon Falls Lane*, dated August 7, 2006 (for the City of Pigeon Forge)
5. *Corps, TDEC and TVA Permit Applications, Teaster Lane – Jake Thomas Road Improvement Project*, dated January 24, 2007 (for the City of Pigeon Forge)

The attendees at the meeting understand that once TDEC has reviewed the information contained herein and determined that the applications are complete, concurrent public notices for the entire project would be preferred. The applicants agree that it is in the best interest of the project to notice all of the permit applications at one time, with the Corps of Engineers public notices, if possible. The applicants have also requested that a notice for a public hearing be published at the same time. Given the magnitude of the project, a public hearing request is likely, and the applicants would prefer to be proactive in addressing this issue.

As discussed, neither the City nor PFLLC are in the final engineering design phases of their respective building projects, although the City has made substantial progress on the road plans and has selected a contractor for Pigeon Falls Lane, pending TDEC approval of the SWPPP. Permitting issues will need to be resolved before funds for design and engineering for the proposed buildings are available. Both the City and PFLLC have made a commitment to use subsurface water quality collection and treatment systems as discussed herein. In addition, both parties are interested in green roofs and other innovative, energy-saving and environmentally friendly water quality management techniques that can be utilized where feasible on their respective projects. The information provided by their consulting teams, combined with the information provided by USGBC and AMEC, demonstrates that attention to water quality has immediate and long-term benefits to the project.

On behalf of the City and PFLLC representatives in attendance for the April 26th meeting, S&ME would like to thank TDEC for their role in facilitating this discussion, and for recruiting Mr. Andy Reese of AMEC and Ms. Judith Webb of the USGBC to share their expertise with the group. The parties involved appreciate your assistance with this project. If you have any questions, or require additional information, please call.

Sincerely,
S&ME Inc.



Elizabeth M. Porter, P.G.
Project Manager



Eric M. Solt, P.G.
Environmental Services Manager

cc: Mr. Paul Sloan, TDEC
Mr. Paul Davis, TDEC
Mr. Dan Eagar, TDEC
Ms. Earlene Teaster, City of Pigeon Forge
Mr. John Jagger, City of Pigeon Forge
Mr. Buddy Kaplan, Riverwalk, LLC
Mr. Michael McCall, Strategic Leisure
Mr. Jason Brady, Gresham Smith and Partners
Mr. Norm Johnson, Waterfield Design

Attachments: List of April 26, 2007 TDEC Meeting Attendees
Figures 1-12

s:\\projects2005\\679 \\Permitting\\addendum for Pigeon Forge

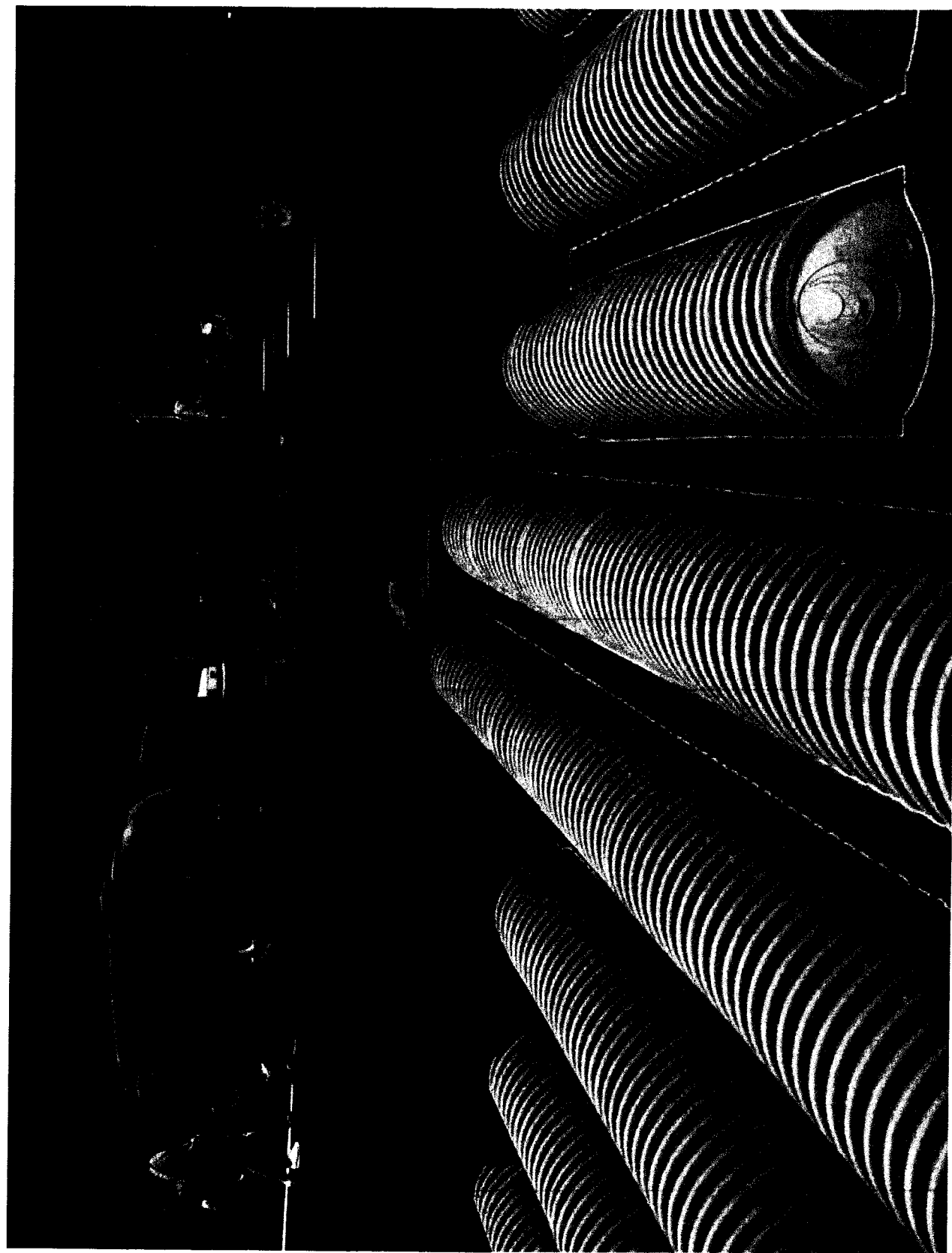
Attendee List

Pigeon Forge/TDEC Meeting April 26, 2007, TDEC Office – Nashville, TN

<u>Name</u>	<u>Firm/Agency</u>	<u>E-Mail Address</u>
Paul Sloan	TDEC	paul.sloan@state.tn.us
Mike Lee	TDEC/WPC	mike.lee@state.tn.us
Dan Eager	TDEC/WPC	dan.eager@state.tn.us
Paul Davis	TDEC/WP	paul.estill.davis@state.tn.us
April Barker	AMEC	april.barker@amec.com
Andy Reese	AMEC	Andrew.reese@amec.com
Norm Johnson	WDG	njohnson@waterfielddesign.com
Jason Brady	GS&P	jason_brady@gspnet.com
Michael Cochrane	GS&P	Michael_cochrane@gspnet.com
Michael Flatt	GS&P	Michael_flatt@gspnet.com
John Jagger	Pigeon Forge	jjagger@cityofpigeonforge.com
Earlene Teaster	Pigeon Forge	eteaster@cityofpigeonforge.com
Sandy Reagan	S&ME, Inc.	sreagan@smeinc.com
Liz Porter	S&ME, Inc.	lporter@smeinc.com
Michael McCall	Pigeon Falls Leisure Land Co., LLC	mmccall@strategicleisure.com
Hugh F. Hughes	Rock & Waterscape	hhughes@rockandwaterscape.com
Judith Webb	US Green Building Council	jwebb@usgbc.org

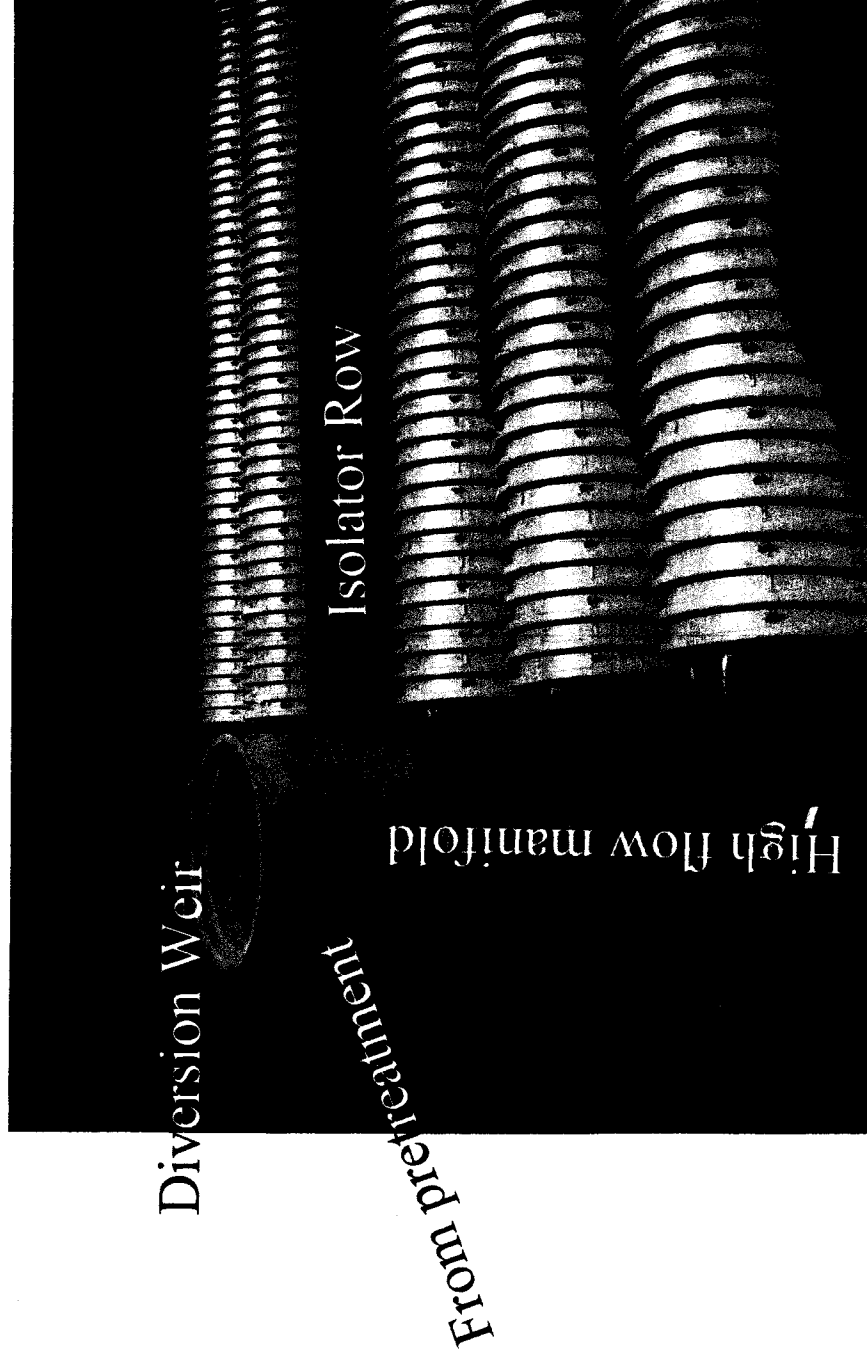


**PIGEON FORGE ADDENDUM
FIGURE 1**



**PIGEON FORGE ADDENDUM
FIGURE 2**

Isolator™ Row



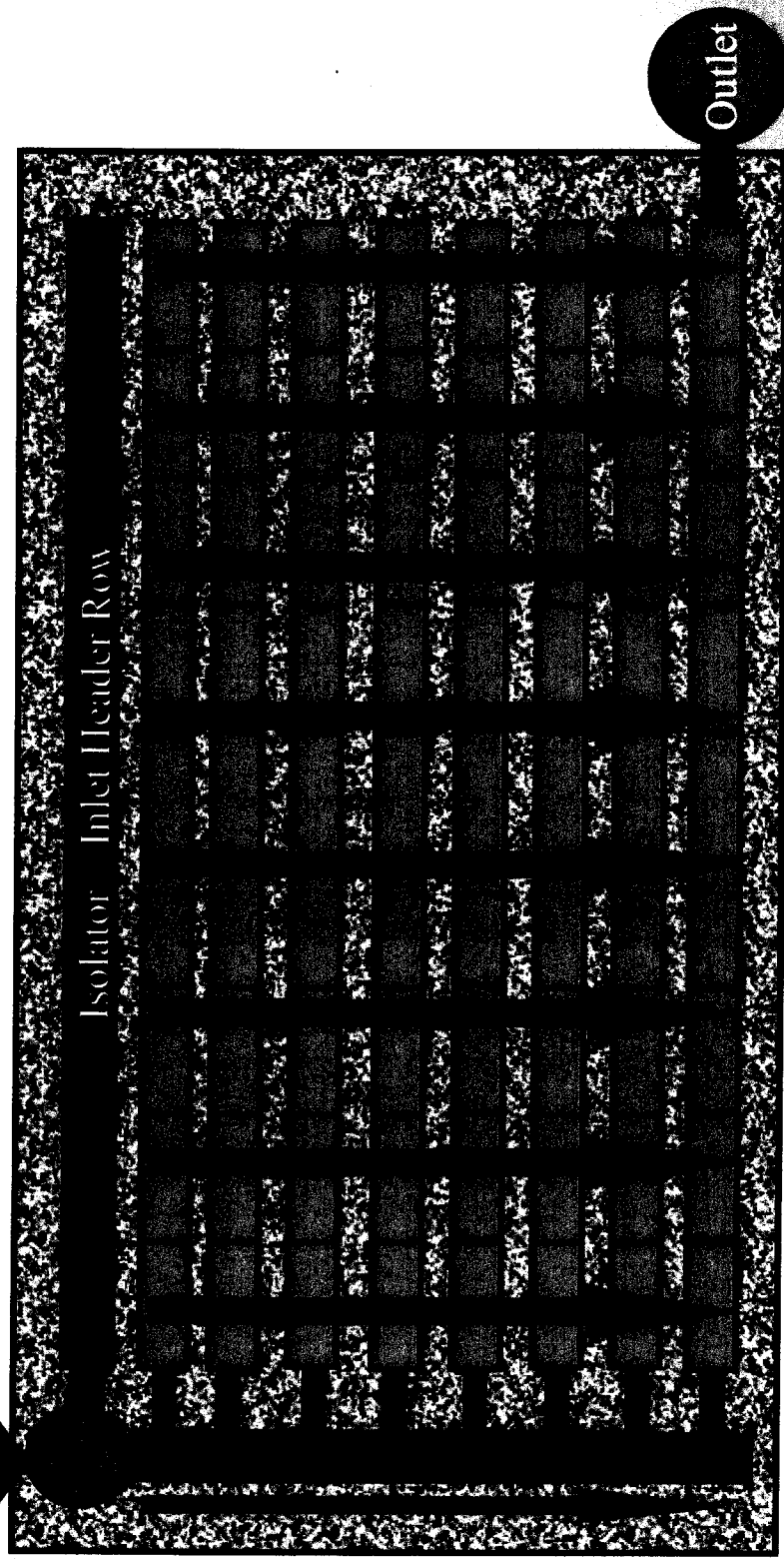
PIGEON FORGE ADDENDUM
FIGURE 3

Isolator™ Inlet Control System



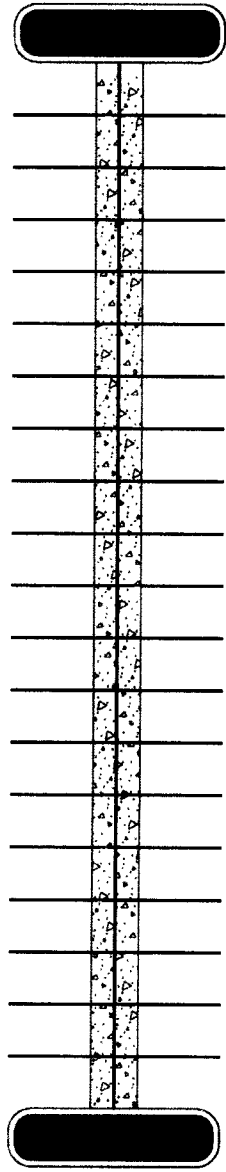
From WQU

Sediment Removal System

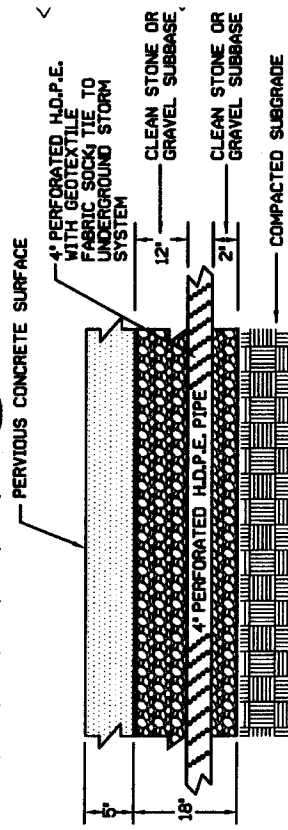
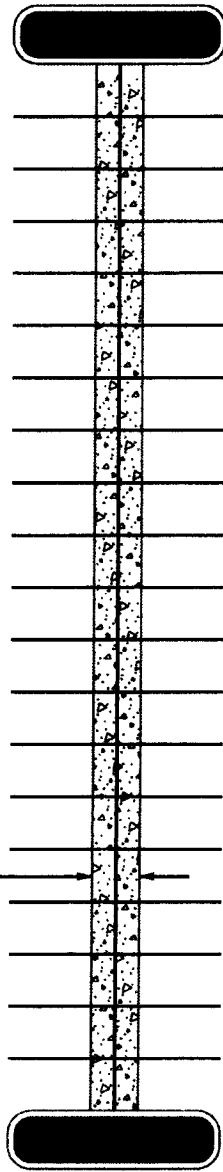


PIGEON FORGE ADDENDUM
FIGURE 4

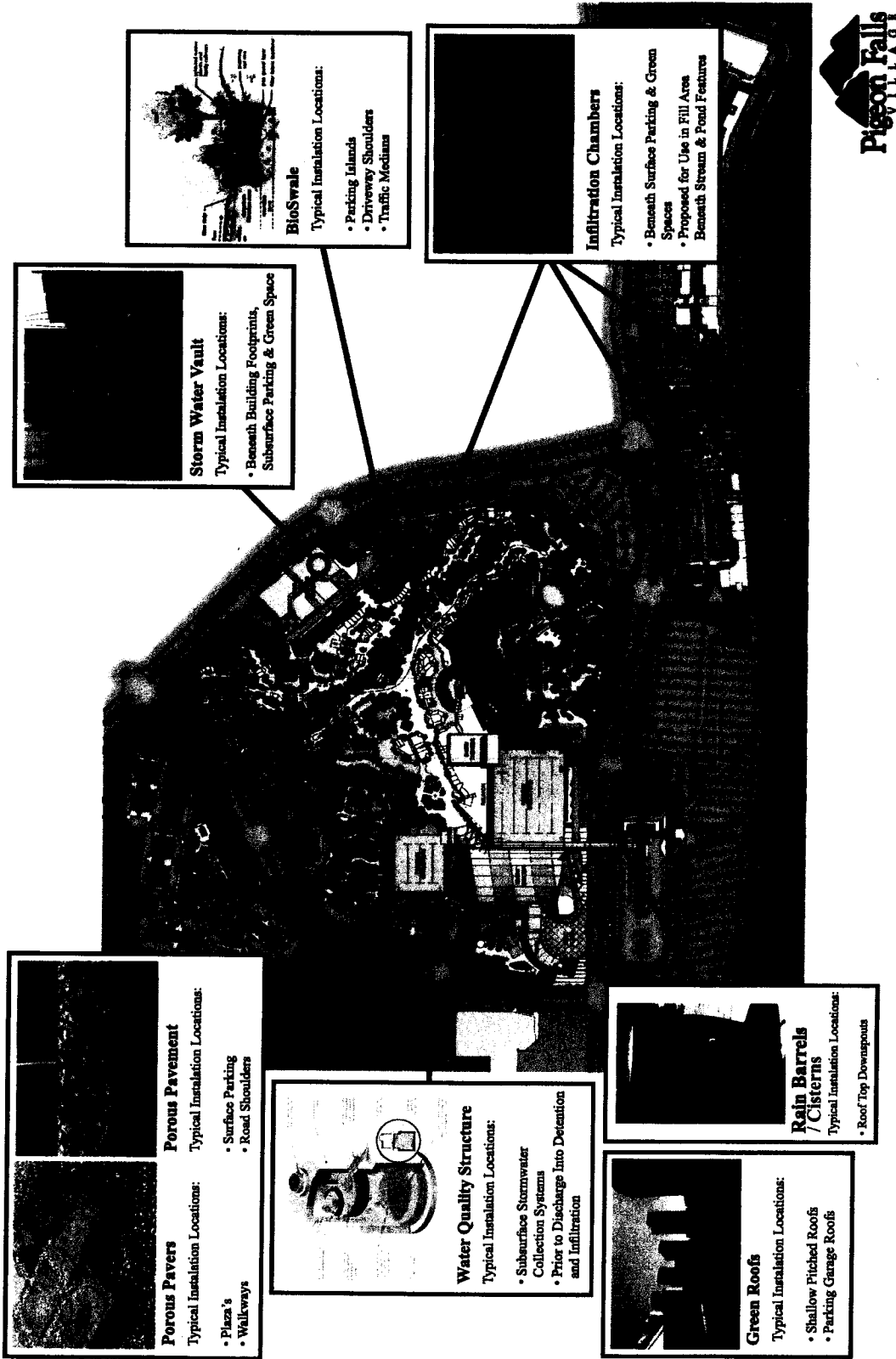
Pervious Pavement



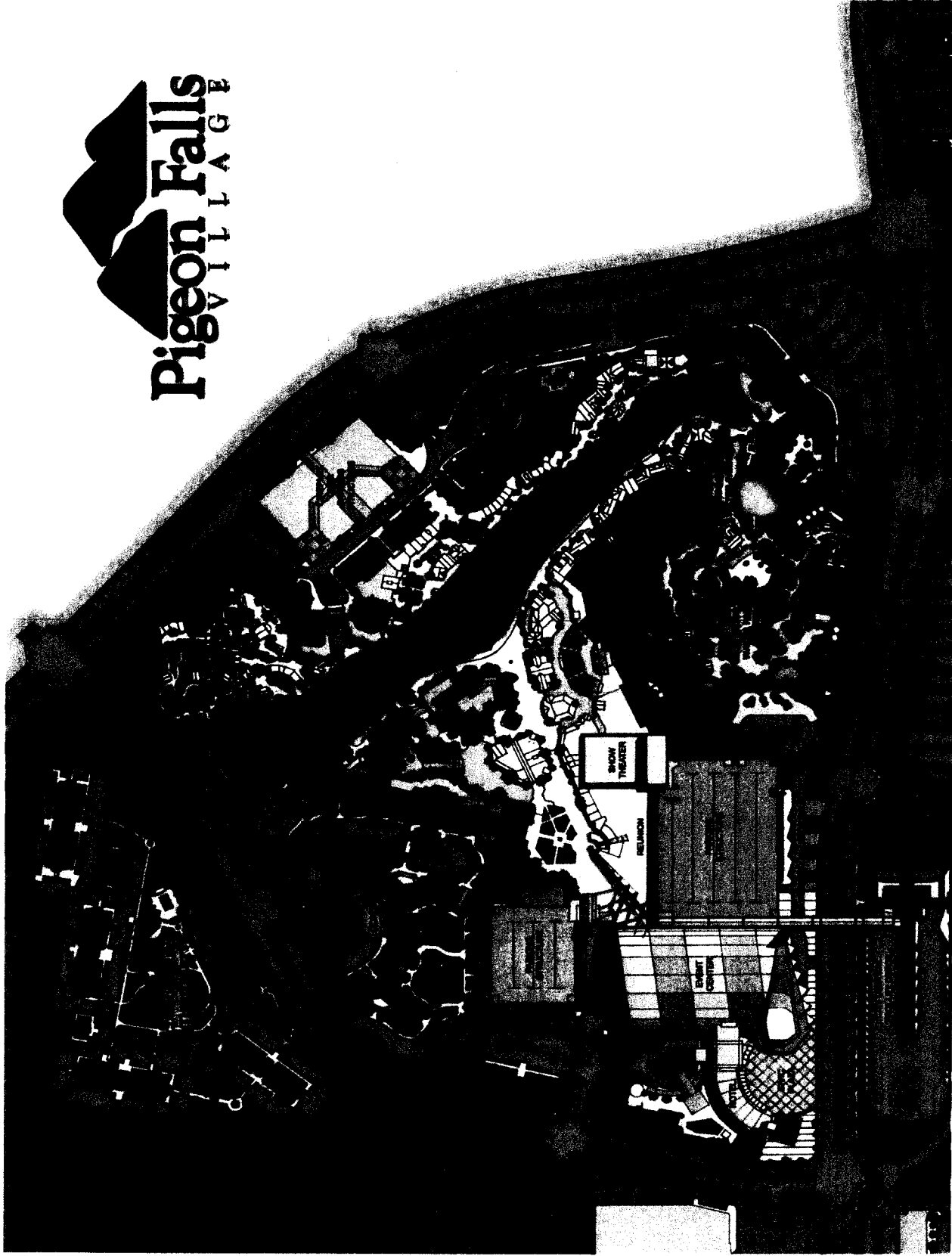
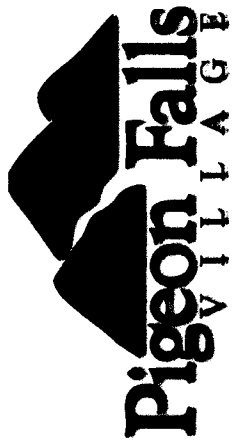
8" PERVIOUS CONCRETE STRIP (TYP.)



PIGEON FORGE ADDENDUM
FIGURE 5



**PIGEON FORGE ADDENDUM
FIGURE 6**



PIGEON FORGE ADDENDUM

FIGURE 7



Pigeon Falls Village

Above & Beyond



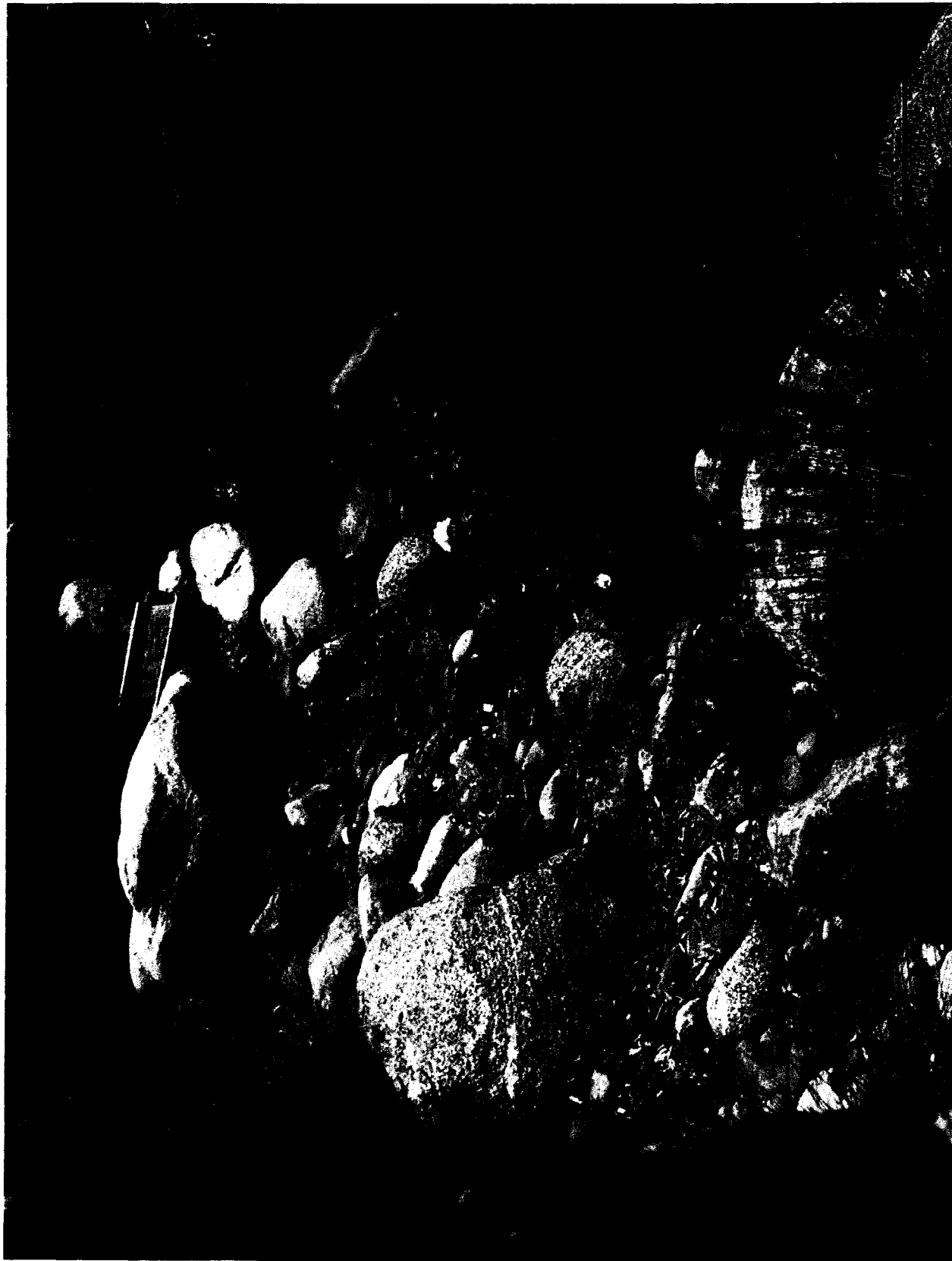
PIGEON FORGE ADDENDUM
FIGURE 8



Village Retail



PIGEON FORGE ADDENDUM
FIGURE 9



**PIGEON FORGE ADDENDUM
FIGURE 10**

TRANSVERSE SECTION

Rigid Pipe Section (Prestressed)

Epoxy Resin Mortar

Reinforced Concrete

Cast-in-Place Polymer Concrete

Original Grade

Washed Stone Backfill

Emergency Capital Pipe Joint Polymer Chamber System

Washed Stone Backfill

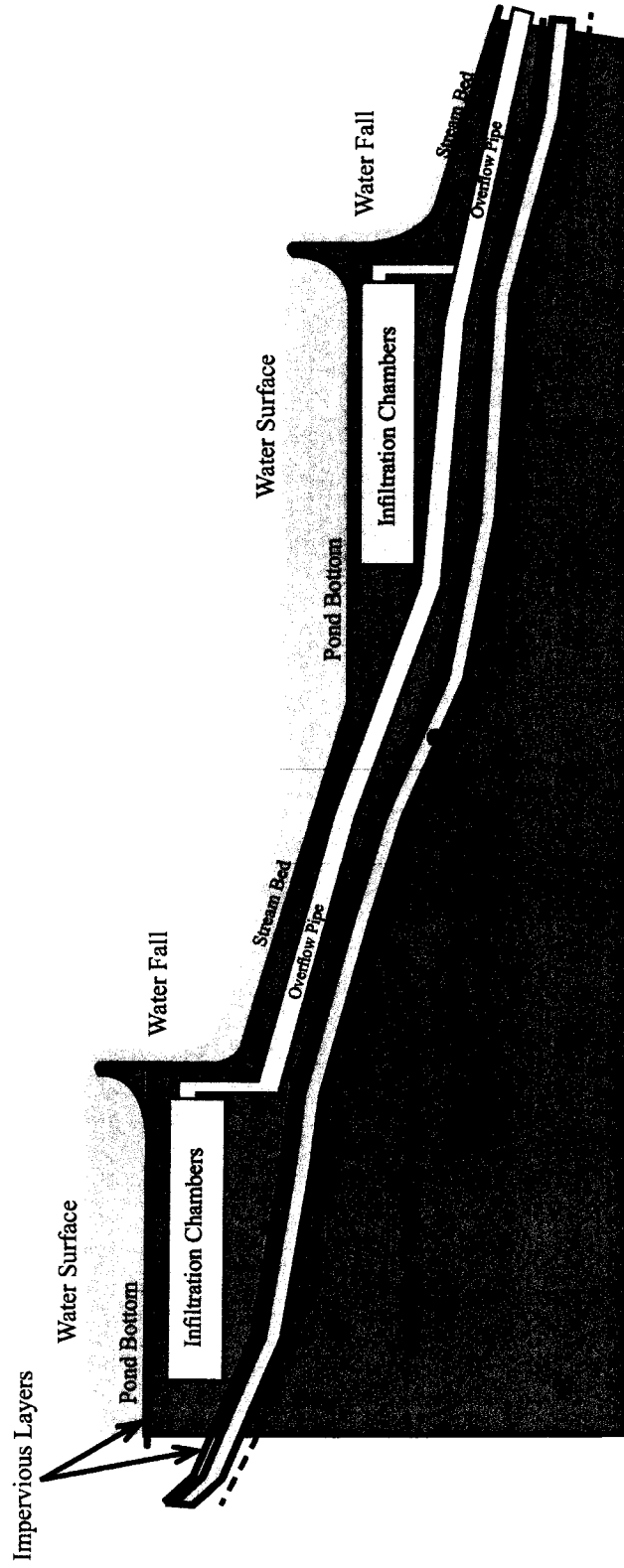
Contract Form
No. P-7000 Rev. 10/68

Project No. 100-1000000

HDPE 2.0"

PIGEON FORGE ADDENDUM
FIGURE 11

Longitudinal Section



**PIGEON FORGE ADDENDUM
FIGURE 12**

Appendix B
Water Quality Certification



**TENNESSEE DEPARTMENT OF ENVIRONMENT & CONSERVATION
DIVISION OF WATER POLLUTION CONTROL
401 CHURCH STREET
7th FLOOR L & C ANNEX
NASHVILLE, TENNESSEE 37243-1534**

Certified Mail Receipt 7099 3400 0014 0976 0946

December 7, 2007

Mr. Bernard Kaplan, Mgr.
Pigeon Falls LLC
997 West Kennedy Blvd., Suite 25A
Orlando, FL 32810

**Subject: §401 Water Quality Certification; State of Tennessee
Application NRS 06-250 – Pigeon Falls Village Two unnamed
tributaries to the West Prong Little Pigeon River; Pigeon
Forge, Sevier County.**

Dear Mr. Kaplan:

We have reviewed your application for the proposed encapsulation of 3,075 linear feet of two unnamed tributaries (Stream A and Stream B) to the West Prong of the Little Pigeon River. Pursuant to §401 of the Federal Clean Water Act (33 U.S.C. 1341), the state of Tennessee is required to certify whether the activity described below will violate applicable water quality standards.

Subject to conformance with accepted plans, specifications and other information submitted in support of the referenced application, the state of Tennessee hereby issues certification for the proposed activity (enclosed). Failure to comply with the terms of this permit or other violations of the *Tennessee Water Control Act of 1977* is subject to penalty in accordance with T.C.A. § 69-3-115.

It is the responsibility of the permittee to ensure that all contractors involved with this project have read and understood the permit conditions before the project begins. If you need any additional information of clarification, please contact Mike Lee at 615-532-0712 or by e-mail at Mike.Lee@state.tn.us.

14 DEC 2007

**\$401 CERTIFICATION
PIGEON FALLS LLC
NRS #06.250
PAGE 2.**

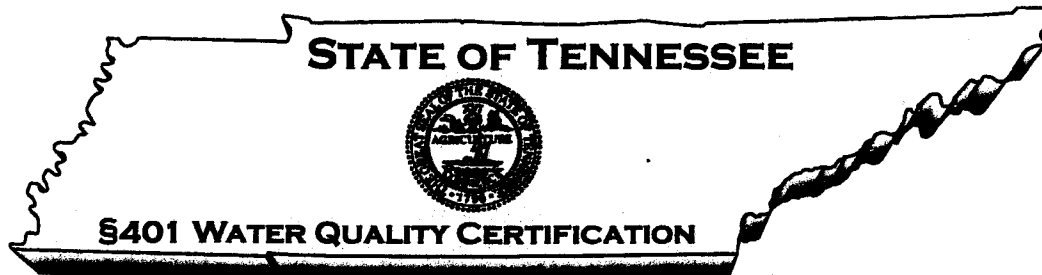
Sincerely,

A handwritten signature in black ink that reads "Mike Lee". The signature is written in a cursive, flowing style.

Mike Lee
Natural Resources Section

Cc: Knoxville Environmental Field Office
Ruben Hernandez, U.S. Army Corps of Engineers, Nashville District
Tom Welborn, U.S. Environmental Protection Agency, Atlanta, GA
Lee Barclay, U.S. Fish and Wildlife Service, Cookeville, TN
Rob Todd, Tenn. Wildlife Resources Agency, Nashville, TN
Stan Davis, TVA
Liz Porter, S&ME, Inc.
File Copy.

**§401 CERTIFICATION
PIGEON FALLS LLC
NRS #06.250
PAGE 3.**



NRS 06.250

Pursuant to §401 of the Federal Clean Water Act (33 U.S.C. 1341), the state of Tennessee is required to certify whether the activity described below will violate applicable water quality standards. Accordingly, the Division of Water Pollution Control requires reasonable assurance that the activity will not violate provisions of *The Tennessee Water Quality Control Act of 1977* (T.C.A. § 69-3-101 et seq.) or of §§ 301, 302, 303, 306 or 306 of *The Clean Water Act*.

Subject to conformance with accepted plans, specifications and other information submitted in support of application NRS 06.250, the state of Tennessee hereby certifies the activity described under authorized work below pursuant to 33 U.S.C. 1341. This shall serve as authorization pursuant to §T.C.A. 69-3-101 et seq.

PERMITTEE: Pigeon Falls LLC

AUTHORIZED WORK: The encapsulation of 3,075 linear feet of two unnamed tributaries (Stream A and Stream B) to the West Prong of the Little Pigeon River.

LOCATION: North-northeast of intersection of Jake Thomas Road and Teaster Lane, former Jake Thomas Farm in Pigeon Forge.

EFFECTIVE DATE: December 7, 2007

EXPIRATION DATE: December 6, 2012

SPECIAL CONDITIONS:

1. The work shall be accomplished in conformance with the accepted plans, specifications, data and other information submitted in support of the above application and the limitations, requirements and conditions set forth herein.

**§401 CERTIFICATION
PIGEON FALLS LLC
NRS #06.250
PAGE 4.**

2. No impacts to any waters of the state by this project, other than those specifically addressed in the plans and this permit, are allowed. All other streams, springs and wetlands shall be fully protected prior, during and after construction until the area is stabilized. Any questions, problems or concerns that arise regarding any stream, spring or wetland either before or during construction, shall be addressed to the Division of Water Pollution Control, 865-594-6035. Wetlands outside of the proposed area of impact shall not be used as storage or staging areas for equipment.

3. All work shall be carried out in such a manner as will prevent violations of water quality criteria as stated in Rule 1200-4-3-.03 of the Rules of The Tennessee Department of Environment and Conservation. This includes but is not limited to the prevention of any discharge that causes a condition in which visible solids, bottom deposits, or turbidity impairs the usefulness of waters of the state for any of the uses designated by Rule 1200-4-4. These uses include fish and aquatic life, livestock watering and wildlife, recreation, irrigation, industrial water supply, domestic water supply, and navigation.

4. Appropriate steps shall be taken to ensure that petroleum products or other chemical pollutants are prevented from entering waters of the state. All spills must be reported to the appropriate emergency management agency, and measures shall be taken immediately to prevent the pollution of waters of the state, including groundwater.

5. Adverse impacts to formally listed state or federal threatened or endangered species or their critical habitat is prohibited.

6. This permit does not authorize adverse impacts to cultural, historical or archeological features or sites.

7. A compensatory stream mitigation plan for the encapsulation of 3,075 linear feet of two unnamed tributaries (Stream A and Stream B) to the West Prong of the Little Pigeon River shall be in accordance with "Rule 1200-4-7-04(7)(a) Mitigation of state waters other than wetlands": Mitigation measures include, but are not limited to: 1. Restoration of degraded stream reaches and/or riparian zones; 2. New (relocated) stream channels; 3. Removal of pollutants from hydrologic buffering of stormwater runoff; 4. Any other measures which have a reasonable likelihood of increasing the resource value of a state water.

**§401 CERTIFICATION
PIGEON FALLS LLC
NRS #06.250
PAGE 5.**

8. In order to accomplish the compensatory stream mitigation the permittee shall conduct the following:

- A. The proposed project shall be LEED (Leadership in Energy and Environmental Design) certified and utilize low impacts designs (LID) techniques that will maintain or replicate the predevelopment hydrologic regime through the use of design techniques to create a functionally equivalent hydrologic landscape. Hydrological functions of storage, infiltration, ground water recharge as well as the volume and frequency of discharges are maintained through the use of integrated and distributed micro-scale stormwater retention and detention areas, reduction of impervious surface, and the lengthening of flow paths and runoff time. Specifically these design techniques will include, but are not limited to, water efficient landscaping, innovative wastewater technologies, water use reduction, disconnection of roof and paved areas from traditional drainage structures into vegetated swales, buffers, strips, bioretention areas, rain gardens. Native vegetation shall be utilized emphasizing soil amendments and trees. LID techniques will be distributed throughout the development. Impervious surface reduction shall be a priority with use of pervious pavement in parking, sidewalks and in the overall reduction of these structures. At least three months prior to construction of any phase the permittee shall submit a draft plan of that phase for approval detailing the Low Impact Development design techniques, and the LEED certification techniques, and a long-term maintenance plan of these techniques. The plan shall compare pre- and post development site hydrology. (35% of the mitigation).
- B. The permittee shall assist the City of Pigeon Forge in the development of a Comprehensive Stormwater Management Plan. The plan shall identify specific goals, including the establishment of targeted sediment reduction goals, and provide an implementation schedule to improve stormwater management in the City of Pigeon Forge. The plan should ensure that water quality from post construction stormwater meet the requirements for post construction similar to what is utilized by the City of Knoxville as well as other state programs. (20% of the mitigation)

**§401 CERTIFICATION
PIGEON FALLS LLC
NRS #06.250
PAGE 6.**

- C. The permittee shall conduct offsite stream mitigation of habitat loss within the watershed. If insufficient or no opportunities are identified, after demonstration that reasonable effort has been undertaken, within 6 months of the issuance of the 404 and 401 permits then the permittee shall utilize the Tennessee Stream Mitigation Program (TSMP) (45% of the mitigation).

9. In order to prove the adequacy and viability of the stream mitigation plan the permittee and the City of Pigeon Forge shall monitor the surface water discharge. On site post construction monitoring will occur quarterly at the three confluences of the onsite streams with the West Prong and several locations within the development. In addition, a similar development will be chosen within the City for monitoring that has none of these stormwater designs. A minimum of one grab sample will be taken. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours for the previously measurable (greater than 0.1 inch rainfall) storm event. The required 72-hour storm event interval is waived where the preceding measurable storm event did not result in a measurable discharge from the activity. The required 72-hour storm event interval may also be waived where the permittee documents that less than a 72-hour interval is representative for local storm events during the season when sampling is being conducted. The grab sample shall be taken during the first 30 minutes of the discharge. If this is not practicable then a garb sample can be taken during the first hour of the discharge. Total suspended solids, settleable solids, metals (asbestos, oil/grease, TPH (total petroleum hydrocarbons), nutrients (phosphates and nitrates), flow, temperature and dissolved oxygen will be monitored. To compare pre- and post development concentrations baseline data shall be collected for these pollutants in the West Prong prior to development. Cut-off concentrations will follow those of Table AD-1 of the Tennessee Stormwater Multi-Sector General Permit. If the results of the monitoring reveal that cut-off concentrations exceed Table AD-1 and pre-development baseline concentrations the permittee shall within 60 days from the event review its stormwater plan and make modifications or additions necessary to reduce the concentrations. A draft plan shall be submitted to the division for approval within 3 months of the issuance of the 404 and 401 permits.

10. Any approved offsite stream mitigation (condition #8 C.) shall include monitoring protocol, performance criteria and reporting schedule.

**§401 CERTIFICATION
PIGEON FALLS LLC
NRS #06.250
PAGE 7.**

11. The first monitoring report shall be submitted by October 31, 2008 and each subsequent year until the division notifies the permittee that reporting can be terminated. (If no work has been completed by the due date of the first monitoring report then a no work report shall be submitted.)

12. The permittee shall retain the services of an approved environmental consultant (preferably the consultant who has been involved in the permitting process) to oversee any compensatory mitigation and monitoring. The name of the responsible party shall be submitted to this office within 3 months after receipt of this permit and the COE 404 permit.

13. It is the responsibility of the permittee to convey all the terms and conditions of this certification to all contractors.

14. The compensatory stream mitigation plan that utilizes low impact development (LID) and LEED certification is a demonstration project. The information gathered from this project shall be used in future permitting decisions by the Division.

A copy of this permit, approved plans and any other document pertinent to the activities authorized by this permit shall be maintained on site at all times during periods of construction activity.

This does not preclude requirements of other federal, state or local laws. In particular, work shall not commence until the applicant has received the federal §404 permit from the U. S. Army Corps of Engineers, a §26a permit from the


Tennessee Valley Authority or authorization under a Tennessee NPDES Storm Water Construction Permit where necessary. This permit also serves as a Tennessee Aquatic Resource Alteration Permit pursuant to the *Tennessee Water Quality Control Act of 1977* (T.C.A. § 69-3-101 et seq.).

The state of Tennessee may modify or revoke this permit or seek modification or revocation should the state determine that the activity results in more than an insignificant violation of applicable water quality standards or violation of the act. Failure to comply with permit terms may result in penalty in accordance with T.C.A. §69-3-115.

An appeal of this action may be made to the Water Quality Control Board. In order to appeal, a petition requesting a hearing before the Board must be filed within 30 days after receipt of the permit. In such petition, each contention should be stated in numbered paragraphs that describe how the proposed

**§401 CERTIFICATION
PIGEON FALLS LLC
NRS #06.250
PAGE 8.**

activity would be lawful and the action of the state is inappropriate. The petition must be prepared on 8½" x 11" paper, addressed to the Water Quality Control Board and filed in duplicate at the following address: Paul E. Davis, Director, Division of Water Pollution Control, 6th Floor L C Annex, 401 Church Street, Nashville, Tennessee 37243-1534. Any hearing would be in accordance with Tennessee Code Annotated Section 69-3-110 and 4-5-301 et seq. Questions concerning this certification should be addressed to Mike Lee at 615-532-0712.


Paul E. Davis, P.E.
Director, Division of Water Pollution Control

Appendix C
Joint Public Notice



**US Army Corps
of Engineers.**

Public Notice

Public Notice No. 07-68

Date: August 1, 2007

Nashville District Application No. 200602640 Expires: August 31, 2007

Please address all comments to: Regulatory Branch, 3701 Bell
Road, Nashville, TN 37214-2660; ATTN: J. Ruben Hernandez

**JOINT PUBLIC NOTICE
US ARMY CORPS OF ENGINEERS
AND
TENNESSEE VALLEY AUTHORITY**

SUBJECT: Proposed Stream Encapsulations at Unnamed Tributaries to
the West Prong Little Pigeon River, in Pigeon Forge, Sevier
County, Tennessee

TO ALL CONCERNED: The application described below has been
submitted for a Department of the Army Permit pursuant to **Section
404 of the Clean Water Act (33 USC 1344) and Tennessee Valley
Authority permit pursuant to Section 26a of the TVA Act (16 USC
831y-1)**. Before a permit can be issued, certification must be
provided by the State of Tennessee, Division of Water Pollution
Control, pursuant to Section 401(a)(1) of the CWA, that applicable
water quality standards will not be violated. The applicant has
applied for the State certification by separate application
(NRS 06-250).

APPLICANT: Pigeon Falls, LLC
997 West Kennedy Blvd., Suite 25A
Orlando, Florida 32810

LOCATION: Unnamed tributaries to the West Prong Little Pigeon
River, in Pigeon Forge, Sevier County, Tennessee, Lat 35.8039N,
Lon 83.5640W, USGS Pigeon Forge Topographic Quadrangle.

DESCRIPTION: The applicant proposes to construct a commercial
development known as Pigeon Falls Village (PFV) on an 85-acre
tract located north-northeast of the Jake Thomas Road and Teaster
Lane intersection. The proposed development would include hotels,
retail space, recreational attractions, a residential development,
a parking garage, and a water feature mimicking a natural stream
system.

Approximately 3,347' of impacts to two intermittent/perennial (one
stream includes 272' of ephemeral channel) unnamed tributaries to
the West Prong Little Pigeon River would result from the proposed
development. Both tributaries originate on the property as narrow
shallow channels with scattered herbaceous and hardwood riparian

zones. Stream A is located on the property's western side and measures 1,189' (892' intermittent/perennial and 297' ephemeral). Only 835' of intermittent/perennial channel would be impacted by PFV. The remaining 57' of intermittent/perennial and 297' of ephemeral channels in the upstream portion is to be impacted by the City of Pigeon Forge Road projects (Pigeon Falls Lane). The average channel width and depth is 2-3' and 1.5-2', respectively, with water depths less than 2". Pools, riffles, and point bars, were not visible in the upper portions of the tributary. Macroinvertebrate life was observed. A small pond of 0.41 acres discharges to the south into a stream channel (Stream A-1) of 577' (237' on the subject site and 340' on the Teaster Lane R.O.W.). Stream B is located on the eastern side and measures 2,275' (2,003' intermittent/perennial and 272' ephemeral). The average channel width and depth is 2-3' and 1.5-4', respectively, while flow depths are less than 2". Macroinvertebrates were also found in this stream.

In areas where fill material is to be placed over the existing channel, french drains and pipe would be used in the channel to collect the subsurface seeps and springs. An impermeable layer would be constructed over the french drain and pipe to separate the subsurface flow from the proposed development. The water collected in the french drain would be discharged in the existing channels at the property boundaries.

Alternatives. The applicant considered alternative development schemes to avoid or minimize impacts to the stream channels. The applicant deemed these alternatives unacceptable for several reasons including the following:

1. The physical location of the streams and the manner in which they traverse the property make it impossible for the proposed development to avoid.
2. Due to the topography the proposed cuts and fills and the final grades necessary for development would not allow preservation of the current channel gradients.
3. Available acreage that meets the needs for retail/commercial development in the general vicinity is limited. Taking into consideration location, infrastructure benefits and transportation needs, a comparable site is not available in the Pigeon Forge area.

Mitigation. Suitable mitigation sites in the area were not identified during a search by the applicant; therefore, the applicant proposes compensatory stream mitigation for impacts to

3,075' of stream by payment of \$200/linear foot to the Tennessee Stream Mitigation Program.

In addition, the applicant would incorporate, to the extent practicable, consideration of Leadership in Energy and Environmental Design (LEED) principles. An important water quality feature of the proposed development would be the construction of a closed-loop, biologically filtered waterfall and stream system on the eastern side of the property. In addition to the habitat this feature would provide, the stream system would be underlain by a vertically isolated collection system designed to provide treatment to and reduction of runoff volume from the site. Other onsite water quality treatment options include pervious pavement in pedestrian and vehicular traffic areas, green roofs, storm water vaults, bioswales, rain gardens, infiltration chambers, water quality structures, rain barrels and/or cisterns.

ADDITIONAL PROPOSED AREA DEVELOPMENT: By separate public notices we are advertising additional projects planned for the Pigeon Forge area. Information on these projects may be obtained by visiting: <http://www.lrn.usace.army.mil/cof/notices.htm>

Pigeon Falls Lane: The City of Pigeon Forge proposes the construction of a roadway to alleviate regional traffic problems. (Public Notice 07-67, File 200600583)

Teaster Lane/Jake Thomas Road Improvements and Parking Area: The City of Pigeon Forge proposes to extend Jake Thomas Road, widen Teaster Lane, expand the intersection at Teaster Lane and Jake Thomas Road, and create a regional parking facility as part of its regional road plan to address traffic problems in Pigeon Forge. (Public Notice 07-69, File 200701556)

Plans of the proposed work are attached to this notice.

The decision whether to issue a permit will be based on an evaluation of the probable impacts including cumulative impacts of the activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefit which reasonably may be expected to accrue from the work must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the work will be considered including the cumulative effects thereof; among those are conservation, economics, aesthetics, general environmental concerns, wetlands, cultural values, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property

ownership, and, in general, the needs and welfare of the people. In addition, the evaluation of the impact of the activity on the public interest will include application of the guidelines promulgated by the Administrator, Environmental Protection Agency, under authority of Section 404(b)(1) of the CWA (40 CFR Part 230). A permit will be granted unless the District Engineer determines that it would be contrary to the public interest.

The Corps of Engineers is soliciting comments from the public; federal, state, and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps of Engineers to determine whether to issue, modify, condition, or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

An Environmental Assessment will be prepared by this office prior to a final decision concerning issuance or denial of the requested Department of the Army Permit.

A Phase I archaeological survey was completed by DuVall & Associates, Inc., in 2004. The report entitled: *A Phase I Archaeological Survey of the Proposed Riverwalk Park Development (Management Area A: Uplands) Along Teaster Lane in Pigeon Forge, Sevier County, Tennessee*, documents that no archaeological sites or historic properties were identified on the development site. The Corps agrees with this conclusion and through this notice is requesting concurrence from the Tennessee Historical Commission. This review constitutes the full extent of cultural resources investigations unless comment to this notice is received documenting that significant sites or properties exist which may be affected by this work, or that adequately documents that a potential exists for the location of significant sites or properties within the permit area. Copies of this notice are being sent to the office of the State Historic Preservation Officer.

Based on available information, the proposed work will not destroy or endanger any federally-listed threatened or endangered species or their critical habitats, as identified under the Endangered Species Act. Therefore, we have reached a no effect

Public Notice No. 07-68

determination, and initiation of formal consultation procedures with the U.S. Fish and Wildlife Service is not planned at this time.

Other federal, state, and/or local approvals required for the proposed work are as follows:

a. Tennessee Valley Authority (TVA) approval under Section 26a of the TVA Act. In addition to other provisions of its approval, TVA would require the applicant to employ best management practices to control erosion and sedimentation, as necessary, to prevent adverse aquatic impacts.

b. Water quality certification from the State of Tennessee in accordance with Section 401(a)(1) of the Clean Water Act.

Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider this application. Requests for public hearings shall state, with particularity, the reasons for holding a public hearing.

Written statements received in this office on or before August 31, 2007, will become a part of the record and will be considered in the determination. Any response to this notice should be directed to the Regulatory Branch, Attention: J. Ruben Hernandez, at the above address, telephone (615) 369-7519. It is not necessary to comment separately to TVA since copies of all comments will be sent to that agency and will become part of its record on the proposal. However, if comments are sent to TVA, they should be mailed to Ms. Karen Stewart, Holston-Cherokee-Douglas Watershed Team, 3726 E. Morris Boulevard, Morristown, Tennessee 37813-1270.

If you received this notice by mail and wish to view all of the diagrams, visit our web site at:

<http://www.lrn.usace.army.mil/cof/notices.htm>, or contact Mr. Hernandez at the above address or phone number.

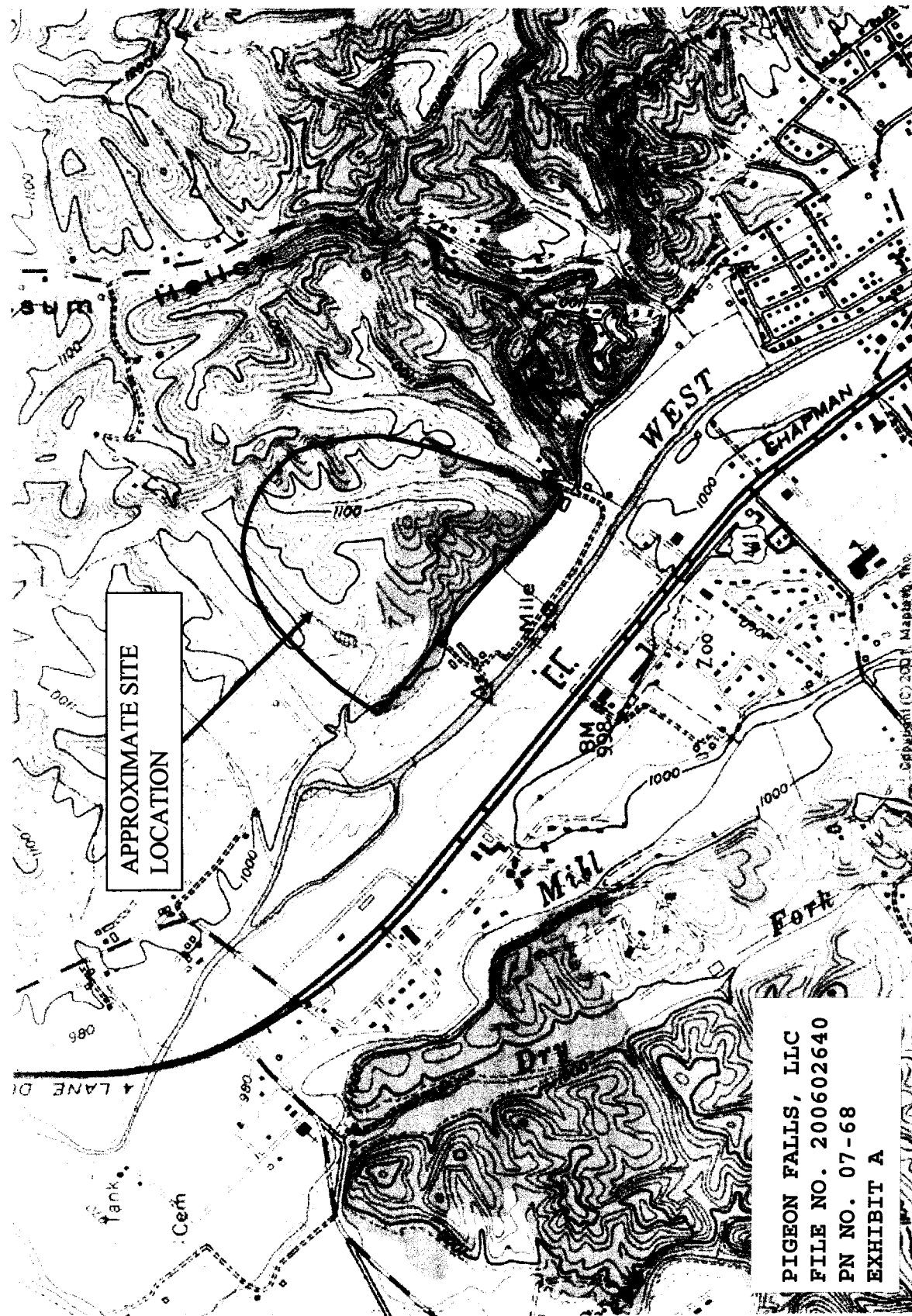

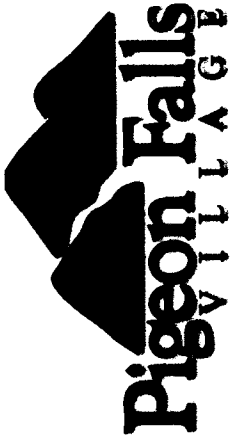
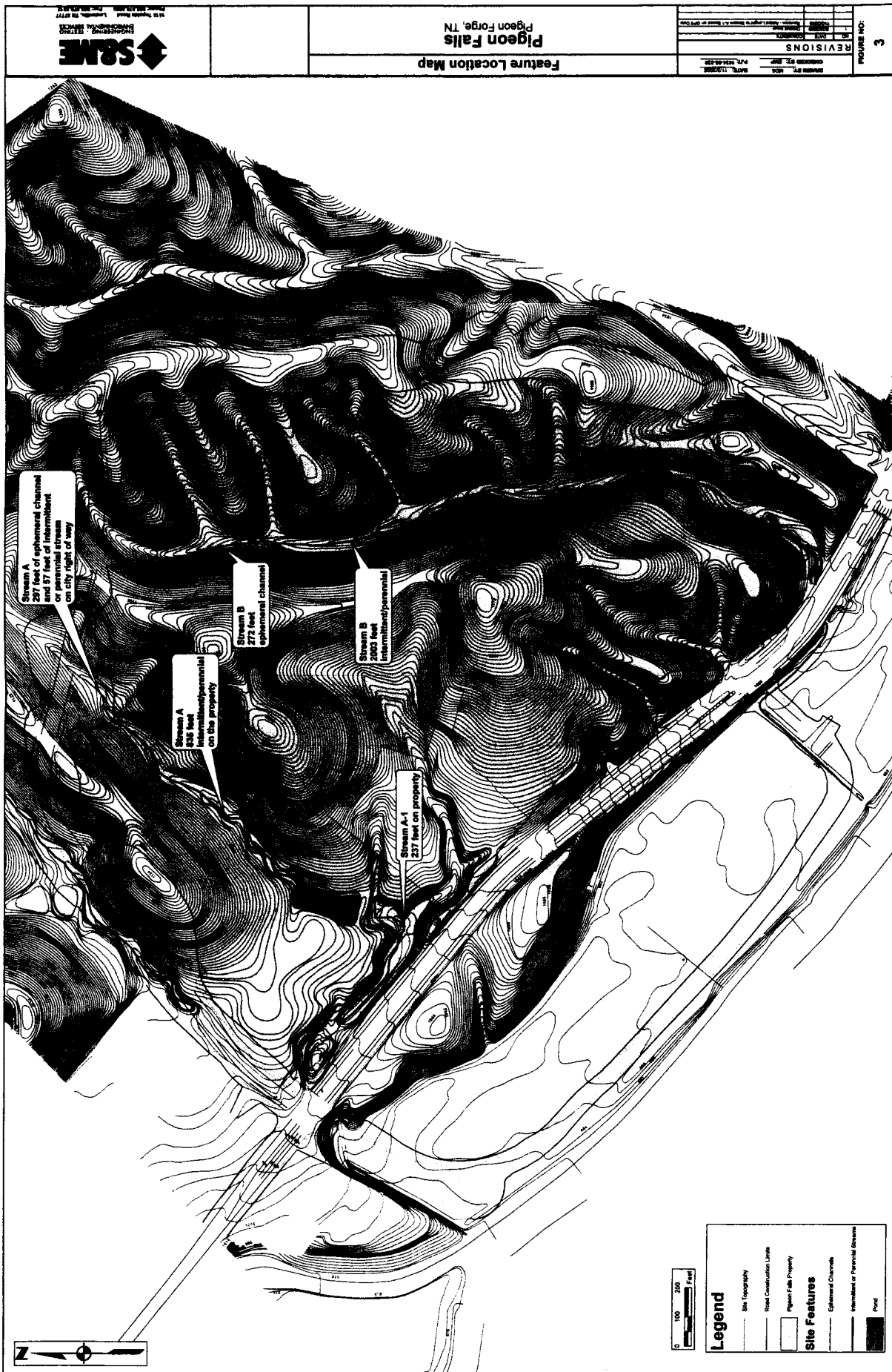


Figure 1		Site Vicinity Map Pigeon Falls Property Development Pigeon Forge, Tennessee Project No: 1434-05-329A	
Topo Name: Pigeon Forge, TN	Scale: 1" = 1500'		
Topo Date: 1956	Checked By: EMP		
Topo Revision: 1970	Drawn By: BD		
Contour Interval: 20 feet	Date: 06/10/05		

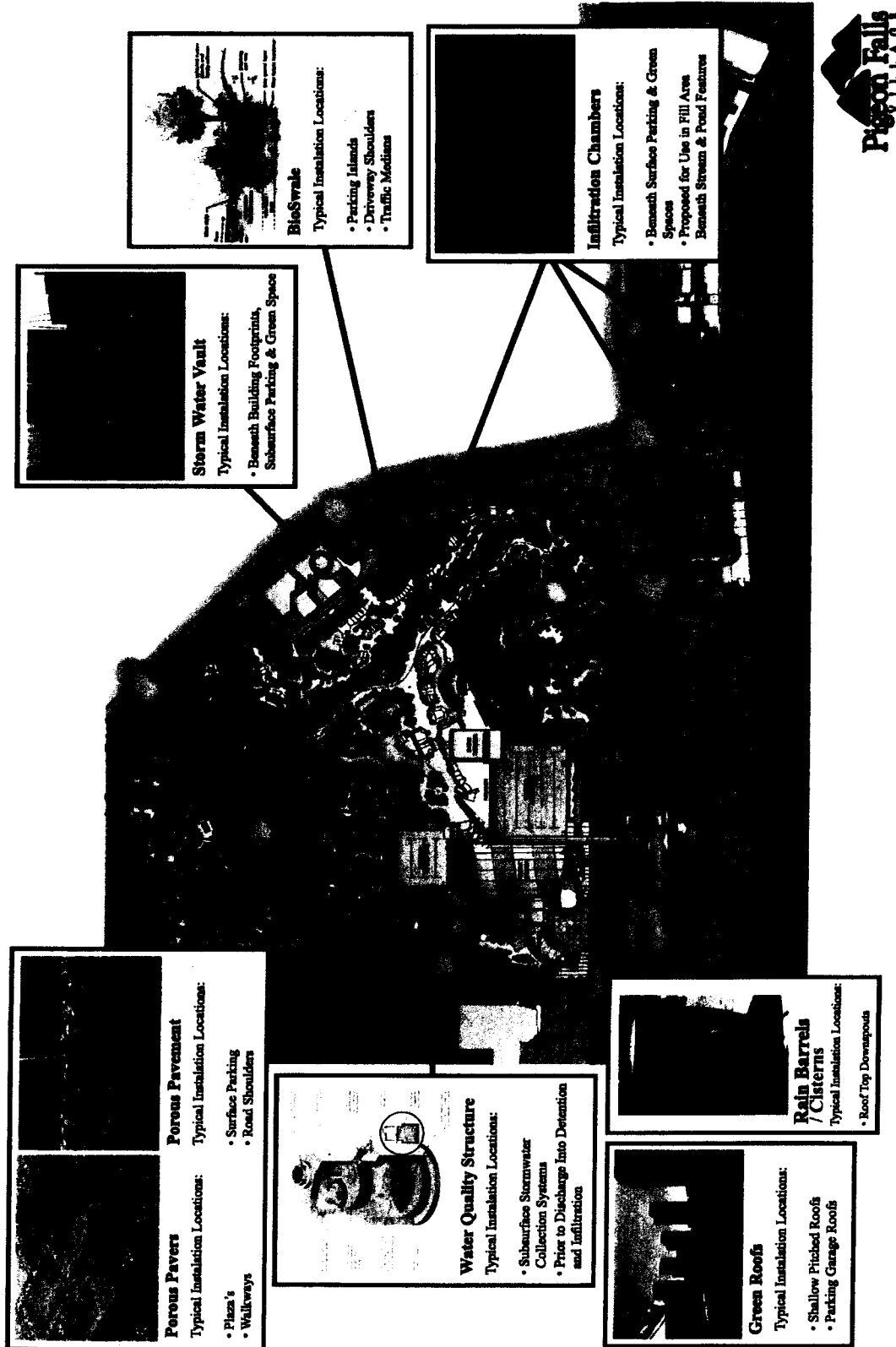


**PIGEON FORGE ADDENDUM
FIGURE 7**

PIGEON FALLS, LLC
FILE NO. 200602640
PN NO. 07-68
EXHIBIT B



PIGEON FALLS, LLC
FILE NO. 200602640
PN NO. 07-68
EXHIBIT C



**PIGEON FORGE ADDENDUM
FIGURE 6**

Appendix D
Public Responses



2006-02640
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TENNESSEE HISTORICAL COMMISSION
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
2941 LEBANON ROAD
NASHVILLE, TN 37243-0442
(615) 532-1550

August 6, 2007

Mr. J. Ruben Hernandez
U.S. Army Corps of Engineers, Nashville District
Regulatory Branch
3701 Bell Road
Nashville, Tennessee 37214

RE: COE-N, ARCHAEOLOGICAL ASSESSMENT, PN# 07-68/
PIGEON FALLS VILLAGE, PIGEON FORGE, SEVIER COUNTY, TN

Dear Mr. Hernandez:

At your request, our office has reviewed the above-referenced undertaking and previously received archaeological survey report in accordance with regulations codified at 36 CFR 800 (Federal Register, December 12, 2000, 77698-77739). Based on the information provided, we find concur the project area contains no archaeological resources eligible for listing in the National Register of Historic Places.

If project plans are changed or archaeological remains are discovered during construction, please contact this office to determine what further action, if any, will be necessary to comply with Section 106 of the National Historic Preservation Act.

Your cooperation is appreciated.

Sincerely,

Richard H. Tom, DSHPO

for E. Patrick McIntyre
Executive Director and
State Historic Preservation Officer

EPM/jmb

09 AUG 2007



United States Department of the Interior

FISH AND WILDLIFE SERVICE

446 Neal Street
Cookeville, TN 38501

August 31, 2007

Lt. Colonel Bernard R. Lindstrom
District Engineer
U.S. Army Corps of Engineers
3701 Bell Road
Nashville, Tennessee 37214

Attention: Mr. Ruben Hernandez, Regulatory Branch

Subject: Public Notice No. 07-68. Pigeon Falls, LLC. Proposed Stream Fill, Sevier County, Tennessee.

Dear Colonel Lindstrom:

Fish and Wildlife Service (Service) personnel have reviewed the subject public notice. The applicant (Pigeon Falls, LLC) proposes to impact approximately 3,075 linear feet of two intermittent/perennial tributaries to the West Prong of the Little Pigeon River in Pigeon Forge, Sevier County, Tennessee. The stream flows, if any, would be placed into a french drain and pipe. Compensatory mitigation for the stream loss would be met by making a payment of \$615,000 to the Tennessee Stream Mitigation Program. The proposed project is needed in order to construct a commercial development known as Pigeon Falls Village. The following constitute the comments of the U.S. Department of the Interior, provided in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) and the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

Endangered species collection records available to the Service do not indicate that federally listed or proposed endangered or threatened species occur within the impact area of the project. We note, however, that collection records available to the Service may not be all-inclusive. Our data base is a compilation of collection records made available by various individuals and resource agencies. This information is seldom based on comprehensive surveys of all potential habitat and thus does not necessarily provide conclusive evidence that protected species are present or absent at a specific locality. However, based on the best information available at this time, we believe that the requirements of section 7 of the Endangered Species Act of 1973, as amended, are fulfilled. Obligations under section 7 of the Act must be reconsidered if (1) new information reveals impacts of the action that may affect listed species or critical habitat in a manner not previously considered, (2) the action is subsequently modified to include activities which were not considered during this consultation, or (3) new species are listed or critical habitat designated that might be affected by the action.

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We do not anticipate significant adverse impacts to fish and wildlife or their habitats as a result of this project. Assuming the applicant makes the appropriate payment to the Tennessee Stream Mitigation Program in a timely manner, we would have no objection to the issuance of a permit for the work described in the subject public notice.

Thank you for this opportunity to review the subject notice. Please contact Robbie Sykes of my staff at 931/528-6481 (ext. 209) if you have questions about these comments.

Sincerely,

A handwritten signature in black ink, appearing to read "Lee A. Barclay". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Lee A. Barclay, Ph.D.
Field Supervisor

xc: Robert Todd, TWRA, Nashville, TN
Dan Eagar, TDEC, Nashville, TN
Darryl Williams, EPA, Atlanta, GA

Hernandez, Jose R LRN

From: Williams.Darryl@epamail.epa.gov
Sent: Tuesday, November 20, 2007 3:34 PM
To: Hernandez, Jose R LRN
Cc: Mikulak.Ronald@epamail.epa.gov
Subject: Pigeon Forge projects, PN #'s 07-67,07-68, 07-69

Ruben, I decided to just email you comments. We have reviewed the additional information forwarded to us on September 11, 2007, for the subject PNs all dated in early August 2007. Your office extended the comment period for review by all agencies. We have completed our review and also discussed these projects with TDEC staff and offer the following comments:

The receiving streams have been classified as Tier 1 Waters which means existing uses must be protected. The applicant(s) are implementing several innovations in their project design (LID, "green" building, subsurface storm water management system, etc.) and promises to maintain downstream flow (@ 0.012 cfs) and water quality. It is recommended that conditions for appropriate BMPs during construction be included in accordance with state requirements and that post-construction monitoring conditions (may include: flow, pH, TSS, turbidity, metals, etc.) are also included in the permit to monitor this situation once these facilities are developed. Also, an adaptive management clause should also be included in the event state water quality standards are contravened.

We recommend that any monies paid into the Tennessee Stream Mitigation (In-Lieu-Fee) Program to offset any remaining impacts not mitigated on site or via alternative storm water mitigation BMPs should be paid prior to or concurrent with construction.

Appendix E
Applicant's Rebuttal

TDEC File Nos.: NRS06-258, NRS07-034, NRS06-250, NRS05-422
USACE File Nos.: 07-67, 07-68, 07-69

September 13, 2007

TDEC DWPC
6th Floor, L&C Annex
Nashville, Tennessee 37243-1534
Attention: Mr. Mike Lee

U.S. Army Corps of Engineers
Nashville District
3701 Bell Road
Nashville, TN 37214
Attention: Mr. Ruben Hernandez

Tennessee Valley Authority
Cherokee-Douglas Watershed Team
3726 E. Morris Boulevard
Morristown, Tennessee
Attention: Ms. Karen Stewart

SUBJECT: **SUPPLEMENT TO PERMIT APPLICATIONS**
City Tract – Former Jake Thomas Farm
Pigeon Forge, Tennessee
S&ME Project Nos. 1434-05-679, -329, -329A

Dear Mike, Ruben and Karen:

On behalf of the City of Pigeon Forge (City) and Pigeon Falls LLC (Pigeon Falls), S&ME is providing this correspondence to respond to comments raised during the permit review process for the above referenced projects. Representatives from the Tennessee Department of Environment and Conservation (TDEC), the City, Pigeon Falls, Gresham Smith & Partners (GS&P), Waterfield Design, and S&ME met on August 29, 2007 to discuss the projects.

The applicants are providing this joint response because the projects under consideration are collectively part of a development scenario for the former Jake Thomas Farm tract. As such, they have been public noticed together to consider the cumulative effect of the

impacts. Likewise, the cumulative impacts of the mitigation efforts should be considered as they collectively address water quality and quantity issues.

PROMOTING GREEN INFRASTRUCTURE

The City has expressed to the regulatory agencies on several occasions the significance of this proposed development to future City planning. The City and the developer have worked closely to plan a project that meets the objectives of all involved parties. Guided by City objectives for the development of the former Jake Thomas farm, local, state and federal regulatory agencies are working together to achieve City objectives within the framework of the current regulatory requirements. Recognizing that water quality and stormwater management are issues of increasing concern, regulatory agencies are tasked with balancing resource protection with sustainable growth and development.

Promoting resource protection strategies, Mr. Benjamin Grumbles, the Environmental Protection Agency (EPA) Assistant Administrator for Water, testified before the United States House of Representatives Subcommittee on Technology and Innovation on May 10, 2007. In his testimony, Mr. Grumbles promoted green infrastructure, referring to "systems and practices that use or mimic natural processes to infiltrate, evapotranspire, or reuse stormwater on the site where it is generated". On March 7, 2007, Mr. Grumbles issued a memorandum to all of EPA's Regional Administrators, expressing "strong support for the increased development and use of green infrastructure in water program implementation".

Recognizing that EPA is promoting and encouraging green infrastructure, the City and the developer have committed to use these techniques in the proposed development. Incorporating input from all involved parties, the proposed development will be a showcase project for the community and for the state, using Low Impact Design (LID) to protect water quality and enhance the development.

WASTEWATER TREATMENT PLANT COMMITMENT

Both TDEC and the City are committed to recovering uses of the West Prong Little Pigeon River (WPLPR), and the City's proposed Wastewater Treatment Plant (WWTP) is a significant component of the recovery process. As part of the Tourism Development Zone package approved by the State of Tennessee, the City has committed to providing up to \$29 million in sales tax revenue from the development for the new WWTP.

Documentation from the City outlining their commitment to this funding is attached.

PROPOSED MITIGATION COMMITMENTS

Mitigation for this project has been evaluated with consideration of TDEC Rule 1200-4-7-04 (7)(c)10, which requires consideration of the quality of the streams to be impacted. As has been previously documented, the features in question are intermittent streams originating onsite. As documented in the permit applications, the streams were evaluated by TDEC as part of the jurisdictional determination, and were found to be degraded, with limited riparian buffer on the downstream portion of the channels, and evidence of previous channel alterations. Prior to the onsite evaluation for the jurisdictional

determination, these intermittent streams had not been assessed by TDEC as part of the 2006 State of Tennessee Stream Assessment Draft (Geographic File), further supporting the assertion that the features are highly intermittent first order features. The TDEC database for similar sized first order streams indicates that they generally have a designated use limited to fish and aquatic habitat. The intermittent nature of the streams would not support fish, and historic agricultural impacts and ongoing urban impacts have reduced the diversity of other aquatic habitats. Discharge from the streams flows directly into the WPLPR, and therefore these channels are not contributors to second or third order streams down gradient of the property.

Mitigation proposed in the permit applications included payment of \$200/foot into the Tennessee Stream Mitigation Program for stream impacts that could not be mitigated onsite. Both TDEC and the applicants in subsequent conversations expressed an interest in modifying this mitigation approach to develop a plan that would more directly benefit water quality in the Pigeon Forge community. Taking into consideration the existing stream conditions, the commitment to green development, and the City's role in planning for their future growth, TDEC and the applicants discussed potential mitigation allocations during the August 29, 2007 meeting.

Following the meeting, S&ME and the applicants have attempted to address the TDEC concerns, and offer the following mitigation strategy. S&ME has attached a draft list of Proposed Special Conditions that reflect the strategy discussed in the following sections. The applicants understand that the proposed mitigation efforts must demonstrate a plan to improve water quality, with specific action items to be implemented, and subsequent monitoring to demonstrate the effectiveness of the selected techniques.

LEED DEVELOPMENT

The applicants propose to collectively offset 25 % of the mitigation effort through a commitment to Leadership in Energy and Environmental Design (LEED) certification. Recognizing EPA's recommendation to utilize green infrastructure in new developments, both the City and Pigeon Falls are committed to achieving LEED certification.

ADDITIONAL LOW IMPACT DESIGN COMPONENTS

The LEED certification process assigns points for green technologies from a variety of design components. As stated in the permit application and in meetings with TDEC representatives, the applicants are committed to addressing onsite stormwater management with a variety of green technologies. As discussed during the August 29, 2007 meeting, the applicants will exceed the available credits in the stormwater management categories under the LEED program. Consequently, the applicants would like to offset an additional 20 % of the mitigation effort through the use of LID technologies that exceed the LEED point structure. These additional LID technologies would also be focused on stormwater management and water quality, and would include the measures previously discussed in the permit applications.

The proposed LID stormwater controls will be designed to limit the offsite discharge of stormwater pollutants to pre-development levels to the maximum extent practicable using Best Management Practices (BMPs). The major goal of these BMPs is to remove an approved amount of Total Suspended Solids (TSS). Most municipalities strive for TSS removal rates of 80%, which will be the goal for the Pigeon Falls Parking and Roadway Improvements project.

The construction of infrastructure to support the Pigeon Falls development will require the use of various BMPs to address water quality. Knoxville's stormwater guidelines will be used in the implementation and design of these BMPs. Listed below are common BMPs that may be utilized in the infrastructure mentioned above to provide 80% TSS removal, as a stand alone BMP or in a treatment train.

Stormwater wet ponds, stormwater wetlands, bioretention areas, and water quality swales, organic filters, underground sand filters, infiltration trenches and perimeter sand filters are able to achieve 80% TSS removal as stand alone BMPs. When combined with other methods, features such as dry detention ponds, stand alone water quality units, gravity separators, and grass channels can also provide the 80% TSS removal required. These BMPs will be implemented in the site design to achieve the desired water quality measures. In some areas, the intent is to use some of the stand alone 80% TSS removal BMPs in conjunction with each other, in an effort to remove greater than 80% TSS.

As an added effort to address overall water quality, the City has previously committed to leaving the stream channels open on the terrace portion of the site to the extent practicable, and creating fringe wetlands where feasible. Both measures will serve to improve water quality in these channels prior to discharging into the WPLPR.

The proposed stormwater controls and improvements to the downstream channel segments are designed to decentralize the stormwater treatment to the extent practicable, and to move beyond conventional stormwater collection systems in the application of LID technologies. For a project of this size, this approach is unprecedented in the East Tennessee region, and is intended to be a showcase for green technologies.

To highlight these efforts, the City has committed to developing an educational program in conjunction with their transportation facility and/or event center, and both the City and Pigeon Falls will highlight the green technologies in their marketing efforts for the development. These opportunities to increase awareness of benefits of green development will assist in promoting this EPA initiative.

COMPREHENSIVE STORMWATER MANAGEMENT PLAN

In accordance with TDEC's request to address regional concerns as well as onsite water quality, 25% of the mitigation effort is proposed to be accomplished through development and implementation of a Comprehensive Stormwater Management Plan (Plan) for the City of Pigeon Forge.

As a first step in this process, the City is prepared to add a full time Stormwater Manager to their staff. Within six months of the hire date, this individual would generate a draft of the Plan for submittal to TDEC. The Plan would identify specific goals and an implementation schedule intended to improve stormwater management in the City.

PHYSICAL HABITAT IMPROVEMENTS

TDEC expressed an interest in improving physical habitat in offsite streams in Pigeon Forge as a component of the mitigation effort. As stated previously, the streams to be impacted are low quality, they originate onsite, and they discharge directly to the WPLPR. Mitigation of the physical habitats provided by these highly intermittent and degraded streams could offset the remaining 30% of the mitigation effort.

Habitat improvement can be accomplished in a variety of ways. The new WWTP planned by the City should reduce pathogen levels in surface waters in the Pigeon Forge area, which is one of the primary contributors to the TDEC 303(d) listing. A second contributor is siltation, which would be a target of the City's Comprehensive Stormwater Management Plan. Phosphorus is also a contributor to the stream impacts. The City will use their Stormwater Management Plan to structure an educational program using media and general mailings to raise community awareness of the phosphorus issue and the link to fertilizer and agricultural activities.

The permit applications currently under review by the regulatory agencies address efforts to search for additional offsite mitigation opportunities. To supplement this activity, the City recently contracted Fuller Mossbarger Scott & May (FMSM) to perform a stream restoration assessment, also intended to identify potential stream mitigation opportunities in Pigeon Forge. Four stream segments were identified by FMSM and the report findings were discussed with representatives of the Tennessee Stream Mitigation Program (TSMP). Due to property owner or TSMP concerns, none of the identified streams has yielded a viable mitigation opportunity.

Combined with the work previously performed by S&ME, the FMSM study demonstrates that the City has put forth considerable effort to locate mitigation sites in their community. The pathogen, siltation, and phosphorus reduction methods mentioned above are also intended to mitigate stream quality. The proposed Stormwater Manager position will also be used to continue to search for mitigation opportunities. If additional opportunities are identified, the sites will be discussed with the regulatory agencies to determine the mitigation credits available. As the development proceeds, in the absence of additional viable stream mitigation opportunities, the applicants request the flexibility to utilize TSMP payment for this portion of the mitigation effort.

SUMMARY

The applicants appreciate the opportunity to provide the regulatory agencies with this summary of the issues discussed during the August 29, 2007 meeting. The items detailed herein are also itemized in the attached Proposed Special Conditions. These conditions are intended to provide our understanding of the requirements TDEC presented in the meeting.

The applicants understand that the regulatory agencies typically have standard permit conditions, and the items addressed herein would be in addition to these standards.

Thank you for your continued assistance with this important and innovative project. The City of Pigeon Forge and Pigeon Falls LLC are committed to creating a showcase development for the State of Tennessee. We hope the information contained herein adequately addresses the objectives outlined by TDEC in our recent meeting. Please contact us if you require additional information.

Sincerely,

Elizabeth Porter, P.G.
Project Manager

Eric Solt, P.G.
Environmental Services Manager

Attachment: City WWTP Commitment
Proposed Special Conditions - Draft

cc: Mr. Paul Sloan, TDEC
Mr. Paul Davis, TDEC
Mr. Dan Eagar, TDEC
Ms. Earlene Teaster, City of Pigeon Forge
Mr. John Jagger, City of Pigeon Forge
Mr. Buddy Kaplan, Riverwalk Park LLC
Mr. Michael McCall, Pigeon Falls Leisure Land Co., LLC
Mr. Norm Johnson, Waterfield Design
Mr. Jason Brady, GS&P

PROPOSED SPECIAL CONDITIONS - DRAFT:

1. The work shall be accomplished in conformance with the accepted plans, specifications, data and other information submitted in support of the above application, and the limitations, requirements and conditions set forth herein. The supporting documentation includes the September 13, 2007 S&ME correspondence submitted on behalf of the City and Pigeon Falls LLC.
2. The project will be LEED Certified. **(25% of the mitigation effort)**
3. In accordance with Rule 1200-4-7-04 (7)(a)3., as part of the mitigation, removal of pollutants from hydrologic buffering of stormwater runoff will be required. This will be accomplished, beyond the LEED Certification of Condition 2, through the use of additional Low Impact Development (LID) Design Techniques. Prior to construction, both the City of Pigeon Forge (City) and Pigeon Falls LLC (the Developer) will be required to submit their respective plans with specific LID components identified. The LID components used for LEED Certification will be identified, along with a minimum of two additional LID components from each party for their respective projects. **(20% of the mitigation effort)**
4. In an effort to prove the adequacy and viability of the mitigation, in accordance with TDEC Rule 1200-4-7-04 (7)(c)9, a surface water monitoring program is to be established. Beginning with the issuance of the permit, or earlier at the discretion of the applicants, surface water discharge will be monitored quarterly at the three confluences of onsite streams with the West Prong Little Pigeon River. The monitoring will occur within 72 hours of a measurable storm event at each location, and the samples will be analyzed for total suspended solids. Annual reports will be required from the applicants for a period of five years, documenting the progress of the development, the LID components installed to date, and the quarterly surface water sampling results. Increases in total suspended solids will be accompanied by a discussion of the presumed cause of the increase and a remedy to address the issue.
5. The City of Pigeon Forge will develop and implement a Comprehensive Stormwater Management Plan. As a first step in this process, the City will add a full time Stormwater Manager to their staff. Within six months of the hire date, this individual would generate a draft of the Plan for submittal to TDEC. The Plan would identify specific goals, including the establishment of targeted sediment reduction goals, and provide an implementation schedule intended to improve stormwater management in the City. **(25% of the mitigation effort)**
6. If offsite opportunities for stream mitigation are identified as the development progresses, the sites will be discussed with the regulatory agencies to determine the mitigation credits available. In the absence of viable stream mitigation opportunities within 6 months of the permit issuance, TSMP will be utilized for the balance of the mitigation. **(30% of the mitigation effort).**

Appendix F
Phase 1 Archaeological Survey Report

DRAFT REPORT

**A PHASE I ARCHAEOLOGICAL SURVEY OF THE PROPOSED
RIVERWALK PARK DEVELOPMENT (MANAGEMENT AREA A:
UPLANDS) ALONG TEASTER LANE IN PIGEON FORGE,
SEVIER COUNTY, TENNESSEE**

Prepared for

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May 2004

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SEVIER COUNTY, TENNESSEE**

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May 2004

MANAGEMENT SUMMARY

A Phase I cultural resources survey of an approximate 122.4-acre (0.19 sq mi / 0.5km²) portion of the proposed Riverwalk Park was conducted by DuVall and Associates, Inc. at the request of Ira Grossman on behalf of Riverwalk Park, LLC. The project is located near the intersection of Jake Thomas Road and Teaster Lane in Pigeon Forge, located in Sevier County, Tennessee. The surveyed parcel, designated Management Area A, includes all of the upland section of the proposed project, located predominantly north of Teaster Lane. Survey of the remainder of the planned project, located on alluvial terraces lying along the West Prong of Little Pigeon River (designated Management Area B) will be covered in separate reports.

The investigations described here were conducted in order to 1) identify any cultural resources located within the Area of Potential Effect (APE) that are listed on or potentially eligible for listing on the National Register of Historic Places (NRHP), 2) to assess the effects of the proposed development construction on any such resources identified, and 3) to provide recommendations for any further cultural resource management activity. The investigation was conducted at the request of the client with the anticipation of meeting any State or Federal permitting requirements.

Management Area A contains moderate to steep-sided uplands drained by small/intermittent streams. The investigation consisted of background research and a pedestrian survey of the entire APE. Where appropriate, shovel tests were excavated at 30-meter intervals. The field survey was conducted over a two-day period in April 2004. Glyn D. DuVall served as the project Principal Investigator and directed field investigations. Mr. DuVall was assisted by Shane McCorkle, Megan Cochrane and Christopher Turvy.

No archaeological sites or other historical properties were identified during the survey. Based on these results, we conclude that no cultural resources eligible for inclusion in the National Register will be affected in Management Area A of the proposed project. No further investigation of this portion of the project is recommended.

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**A Phase I Archaeological Survey of the Proposed Riverwalk Park
Development (Management Area A:Uplands) Along Teaster Lane in
Pigeon Forge, Sevier County, Tennessee**

INTRODUCTION

For planning purposes the larger Riverwalk project has been divided into two management areas (Figure 1). Management Area A, the subject of this report, designates an upland section of the project area which encompasses 122.4 acres. Management Area B includes adjacent areas of floodplain and river terrace which encompass an additional 62.9 acres. The results of the Phase I survey of Management Area B are addressed in two separate reports (Dicks and McCorkle 2004; Thomason 2004).

The survey of Riverwalk Management Area A was undertaken by DuVall and Associates, Inc. at the request of Ira Grossman, acting on behalf of Riverwalk Park, LLC. The project area is located near the intersection of Jake Thomas Road and Teaster Lane in Pigeon Forge, Sevier County, Tennessee. The investigation was initiated at the request of the client and conducted with the anticipation of meeting potential State and Federal requirements that might apply in the future. These include the Tennessee State Burial Law and the National Historic Preservation Act (Public Law 89-665; 16 USC 470; 80 Stat. 915) and implementing legislation 36 CFR 60 and 36 CFR 800.

The purpose of the investigation was to 1) identify cultural resources located within the Area of Potential Effect (APE) that were listed on or potentially eligible for listing on the National Register of Historic Places (NRHP), 2) to assess the effects of the proposed development construction on such resources, and 3) to provide recommendations for any further cultural resource management action.

The investigation consisted of background research and a pedestrian survey of the entire APE. Where appropriate, shovel test excavations were excavated at 30-meter intervals. The field survey was conducted over a two-day period, 5 and 20 April 2004. Glyn D. DuVall served as the project's Principal Investigator and directed field investigations. Mr. DuVall was assisted by Shane McCorkle, Megan Cochran and Christopher Turvy.

No archaeological sites or historic properties were identified as a result of this survey. Based on the results of the investigation, we conclude that no cultural properties eligible for inclusion in the National Register of Historic Places are present in Management Area A. No further investigations are recommended.

All records and materials, including artifacts are in the temporary custody of DuVall and Associates, Franklin, Tennessee. At the conclusion of the project, all records and materials will be transferred to the Tennessee Division of Archaeology for permanent storage and curation.

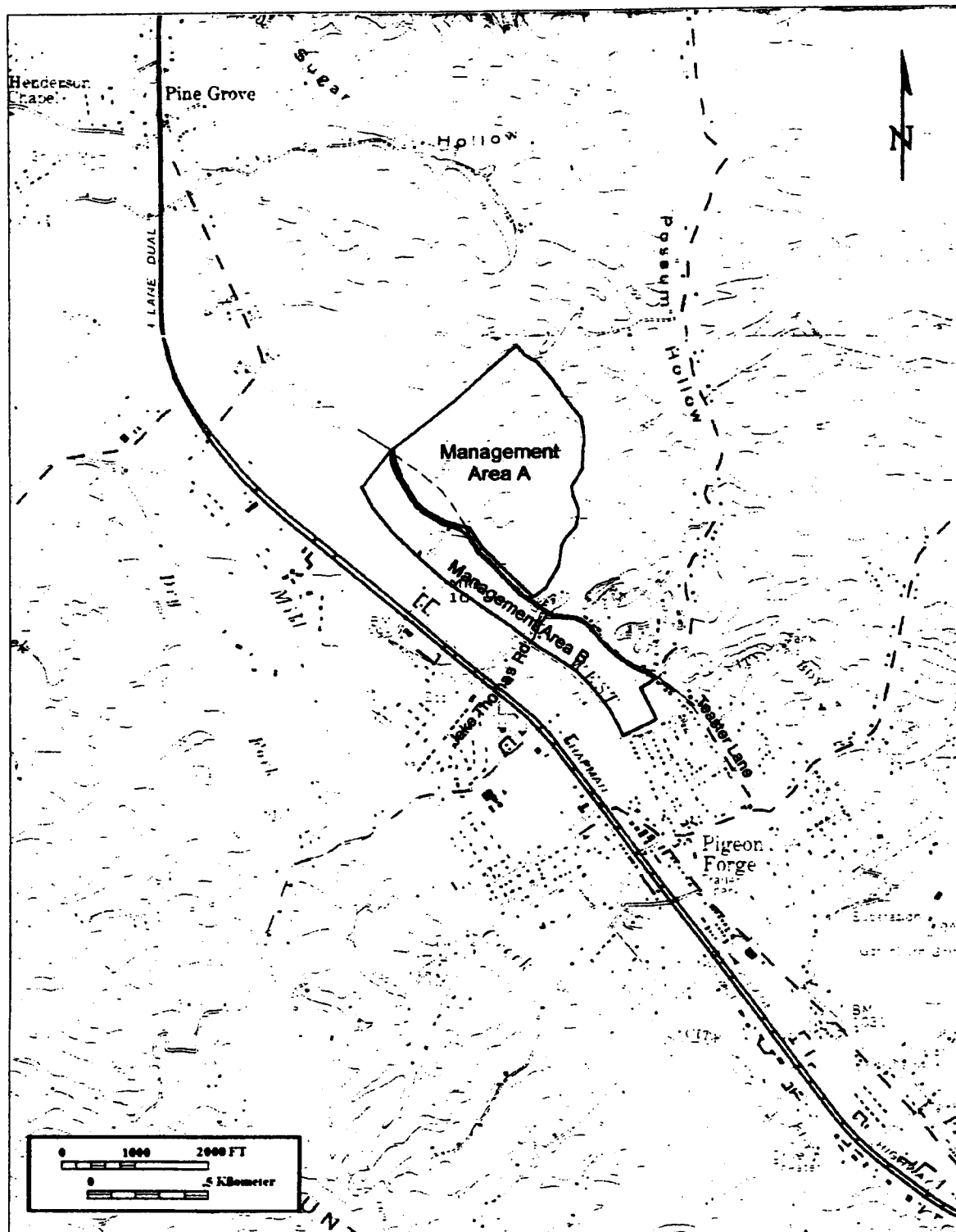


Figure 1. Topographic map showing the project area (Pigeon Forge, Tenn., 156-SE, 1970).

Project Description

The Riverwalk project area is located in the city of Pigeon Forge adjacent to Teaster Lane near its intersection with Jake Thomas Road. Management Area A includes 122.4 acres of upland terrain; 114.2 acres are located on the northeast side of Teaster Lane and 8.2 acres are situated on the southwest side (Figure 1). The eastern and northern boundaries are formed by a long sweeping arc following a fence row and a central ridge line. The western boundary follows a fence row extending up a very constricted drainway. The southern boundary of Management Area A is formed by Teaster Lane on the southeast east and by steep slopes leading down to the floodplain of the West Prong Little Pigeon River on the southwest. Elevation within the uplands ranges from approximately 990 to 1170 ft above mean sea level (amsl).

Riverwalk Park will have a mixture of attractions, including a community civic center, privately owned shops and restaurants, and residential development. The rough terrain of Management Area A will be extensively modified, with the ridgelines cut and the stream valleys filled in.

ENVIRONMENTAL SETTING

The project area is located in the Great Valley of East Tennessee, which is part of the Ridge and Valley Physiographic Province (Fenneman 1938)(Figure 2). Approximately 35 percent of Sevier County lies within this province. The Ridge and Valley is characterized by numerous elongate, parallel ridges and intervening valleys created by severe faulting and folding. The trend of these valleys is northeast to southwest. Relief in the Ridge and Valley will vary as much as 300 ft (Hubbard et al. 1956:5). The underlying rocks of the Great Valley are almost wholly sedimentary (mainly limestones and dolomites) but also include some harder shales and sandstones.

The remaining 65 percent of Sevier County is located in the rugged, steep and mountainous Appalachian Uplands. The rocks in this region are predominantly pre-Cambrian slate and quartzite. Elevations range from about 2500 ft (762 m) to near 5000 ft (1524 m) AMSL.

Sevier County is located within the Western Mesophytic Forest (Braun 1950). This forest type is dominated by oak and hickory stands with lesser stands of ash, mulberry, beech, walnut and maple. These stands lead to bountiful animal populations such as white-tailed deer, squirrel, raccoon, fox and bear.

The climate classification of Sevier County area is mesothermal (Cfa) hot summer (Koeppel and Delong 1958:247-254). The general air movement in the summer is from the southeast which results in strong convection currents and locally intense thunderstorms. Although heavy thunderstorms are frequent, the maximum rainfall occurs in the winter and spring months. Precipitation records indicate that about 54 inches occur annually in the county (Hubbard et al. 1956:11).

Drainage in the county is to the French Broad River via numerous tributaries, many of which originate in the mountains. The West Prong Little Pigeon, lying adjacent to the project on the southwest, is one of the primary mountain tributaries, trending northwest and north through the Pigeon Forge area to a junction with the Pigeon near Sevierville. Management Area A is drained by two small tributary streams, which trend south and southeast to cross the area. Although

shown as blue-line streams on USGS mapping, these steep-sided drainages appear to be intermittent or seasonal features.

Management Area A is located on the southwestern flank of Ore Bank Ridge. The terrain is maturely dissected, and includes predominantly moderate-to-steep side and foot slopes. Low slope areas suitable for habitation are limited to the narrow, generally linear ridge crests that dominate the central and northern portion of the parcel and to localized landform settings along the two small creeks. A series of relatively level-topped footslope benches occur along the southwestern edge of the management area, just above the floodplain. These, however, have been significantly altered by the construction of Teaster Lane.

Soils in the upland portion of the project area are shallow, excessively drained soils derived from the underlying shale. Typically lying on steep slopes, they have been subject to erosion from past episodes of forest clearing and possibly livestock grazing. The majority of soils mapped in the area by Hubbard et al. (1956:41) are characterized as Dandridge/Litz silt-loam "steep phase" soils, associated with 25-65 percent slopes in the area. Soil depth to weathered bedrock ranges from as little as 25 cm to as much as 2 m, depending on slope position and texture of the underlying rock. Isolated, much smaller areas on the lower slopes are mapped as Holston loam, "eroded rolling phase." These are remnant patches of old (pre-Holocene) alluvium which remain on a few level topped benches on lower valley footslopes. The soil survey (Hubbard et al. 1956:75) indicates that these soils usually exhibit a surface layer of 25 cm of friable loam overlying a clay loam subsoil. Field observations indicate that total solum depth throughout the upland area is generally less than 25 cm.

A single area of colluvial soil development is indicated. This is a small area (less than 0.5 ha) of Whitesburg silt loam (Hubbard et al. 1956:112) which occurs along the margins of the small drainage at the extreme southeastern corner of the (upland portion of the) project area. These soils are associated with colluvial/alluvial deposition at the base of steep slopes, and may have a surface layer up to 0.70 cm in depth.

In summary, the project area contains an abundance of natural resources which would have made it attractive for occupation during both the prehistoric and historic periods. For the prehistoric period, generally, the alluvial terraces along the river would have been particularly attractive, offering a variety of resources including abundant water, transportation, a diversity of flora and fauna, and level, naturally productive and easily arable land for horticultural economies. Upland settings, such as found in Management Area A, would have provided an abundance of seasonal resources, such as mast or game animals, but may have been less suitable for long-term settlement due to the prevalence of steep slopes or limited surface water.

The structure of the local environment has significant implications for the differential preservation and discovery of cultural resources. The potential for buried deposits is highest on Holocene terraces closer to the river where the rapid runoff and redeposition of soils is likely to have occurred in the recent past. Given the combination of their easily eroded soils, their primary role in agricultural production, and their lack of potential for the deposition of new sediment, the exposed surfaces of the older (upland) landforms have a low potential for site preservation. Exposed upland settings, like those in Management Area A, which have thin soils within higher slope regimes and are exposed to logging and agriculture, have the lowest potential for site preservation.

CULTURAL-HISTORICAL BACKGROUND

Archaeological investigations in the Eastern Woodlands of North America indicate that human occupation dates to 14,000 years ago and may extend back to 17,000 B.P. (Adovasio et al. 1975). Individual chronological/cultural periods have been constructed based on general trends of development in material culture, and interpretations of subsistence activities, technology, and social organization. These periods and their approximate temporal boundaries are: PaleoIndian (10,000 B.C.-8000 B.C.), Archaic (8000 B.C.-900 B.C.), Woodland (900 B.C.-A.D. 900), Mississippian (A.D. 900-A.D. 1600), and Overhill Cherokee/Historic (A.D. 1600-A.D. 1838).

Paleo-Indian Period (10,000 B.C. -8000 B.C.)

Evidence exists for Native American populations in eastern Tennessee by 10,000 B.C. with an apparently continuous human occupation of the region into historic times. Clovis is the earliest cultural complex recognized (Meltzer 1989), and is archaeologically associated with lanceolate fluted projectile points. Such projectile points are also typical of the slightly later Cumberland complex, defined primarily on the basis of changes in projectile point morphology. Also associated with the Paleo-Indian period are unfluted lanceolate projectile points, bifacial knives, bifacial drills, bipolar cores and flakes, retouched and unretouched blades, and a variety of unifacial tools including graters, spoke shaves, beaks, wedges, and end scrapers. Often PaleoIndian lithic assemblages include select raw materials from exotic sources. Quad (ca. 8800-8000 B.C.), Beaver Lake (ca. 8500-8000 B.C.), Dalton (ca. 8200-7800 B.C.), and Greenbrier (ca. 8000-7500 B.C.) are recognized projectile point types that are associated with the latter part of the Paleo-Indian period. These projectile point types and their associated material assemblages are considered somewhat transitional between the Paleo-Indian and Archaic periods (cf. Breitburg and Broster 1994).

Many Paleo-Indian sites have been recorded for eastern North America, with some of the most important located in Kentucky, Tennessee, and West Virginia. The primary focus of Paleo-Indian activity in Tennessee appears to have been the Western Valley, since 65 percent of the projectile points known and 46 percent of the sites recorded by the Tennessee Division of Archaeology are from within that physiographic province (Breitburg and Broster 1994). While this distribution could be attributed to sampling biases, an apparent correlation between sites and chert outcrops within the region has led Breitburg and Broster to suggest that the Western Valley served as a major focus of Paleo-Indian populations. The Central Basin and Western Highland Rim are believed to have been mainly the focus of restricted activities, perhaps related in part to the exploitation of hypothetically concentrated mastodon populations. The Ridge and Valley and Mississippi River Valley regions are proposed to have witnessed only limited use and occupation by Paleo-Indian groups (Breitburg and Broster 1994).

Subsistence patterns are poorly understood due to the poor and infrequent preservation of floral and faunal materials within Paleo-Indian sites. Based on available evidence it was widely accepted that Paleo-Indian populations survived on a subsistence revolving around the nomadic pursuit of Pleistocene fauna, particularly the larger and now extinct mammals such as the mastodon and bison. More recent contributions and ethnological information have suggested the probability of multiple modes of subsistence among the Paleo-Indian populations varying with specific environmental conditions. There is, for instance, no reason to believe that the southern boreal-deciduous forests would not have supported a more generalized and flexible economy

based upon the exploitation of the wide range of available plant and animal life including an occasional bison or mastodon (Meltzer 1988).

Archaic Period (ca. 8000 B. C. -900 B.C.)

The beginning of the Archaic period corresponds to Native American adaptation to environmental changes wrought with the warming trend of the Holocene. Hunting and foraging subsistence patterns are relatively well preserved in the archaeological record (Asch et al. 1972; Chapman 1975, 1977; Chapman and Shea 1981). The primary faunal resources exploited include bear, white-tailed deer, elk, turkey, raccoon, various small mammals, birds, fish, and invertebrates (Barker and Breitburg 1992; Breitburg 1986; Broyles 1966, 1971; Chapman 1985a, 1985b; Dowd 1989; Lewis and Kneberg 1961:17-24).

The Archaic period has been further divided into Early (ca. 8000-6000 B.C.), Middle (ca. 6000-4000 B.C.), and Late Archaic (ca. 4000-900 B.C.) (Griffin 1967; Steponaitis 1986; Smith 1986) based on transformations in primarily lithic tool forms and subsistence behavior that are documented for the period.

At the beginning of the Archaic period, side- and corner-notched projectile point forms replace the earlier fluted and lanceolate types of the Paleo-Indian period. Extensive investigations in the Lower Little Tennessee River Valley (Chapman 1975, 1977, 1978, 1979) in conjunction with pan-regional information gathered from archaeological research in related and adjacent areas of eastern North America (primarily Broyles 1966, 1971; Coe 1964; Gardner 1974) has resulted in the refinement of the cultural/historical sequence for the Archaic period in eastern Tennessee. A number of phases have been defined within the Early Archaic based upon stratigraphic evidence, associated chronometric dates, and the serration of projectile points into morphological clusters. Proposed phases include Lower and Upper Kirk, St. Albans, LeCroy, and Kanawha (Kimball 1985). An undesignated phase associated with Dalton-like projectile points is also tentatively included in the Early Archaic period although some researchers consider this type a transitional "carry-over" from the preceding Paleo-Indian period.

Except for changes in projectile point morphology much of the lithic assemblage associated with the Early Archaic period is similar or identical to Paleo-Indian tool assemblages. An increased frequency in grinding stones however, suggests a greater emphasis on arboreal seeds in the diet (Chapman 1985b).

Many of the larger and best preserved sites documented in the southeast for the Early Archaic period are located on floodplains (e.g., Broyles 1966, 1971). In east Tennessee these include Rose Island, Icehouse Bottom, Bacon Farm, and Calloway Island (e.g., Chapman 1975, 1977, 1978, 1979). Most of these sites contain the remains of hearths and potentially associated activity areas. Structural remains may also be present although direct evidence in the form of posthole patterns must be regarded as somewhat tenuous (Kimball 1981). Chapman (1985b) suggests that Early Archaic structures may have employed unsubstantial construction techniques leaving little archaeological evidence. Rock shelters were also used, though they appear to have been seasonally occupied (Fowler 1959; Styles et al. 1983).

Limited evidence suggests that Early Archaic peoples lived in base camps from which they ranged during foraging activities exploiting local flora and fauna. While the Early Archaic witnessed a shift

toward increased sedentism over the preceding Paleo-Indian period, base camps were probably occupied on a seasonal level (Chapman 1985b). In a model of Early Archaic settlement, Davis (1990:208-210) has identified evidence to support a tendency for base camps to be located on the first stream terrace in the Lower Little Tennessee River Valley. Short-term hunting camps ("Logistical camps") tend to be located near the valley margins and at the junction of major tributary valleys, presumably correlated with optimum vantage points for viewing game. A shift in the latter part of the Early Archaic period to an emphasis upon limited activities in the surrounding uplands is interpreted as representative of a greater reliance upon hunting. Earlier site distributions tend to reflect an emphasis upon the exploitation of riverine settings (Davis 1990:210).

The ensuing Middle Archaic period (ca. 6000-3000 B.C.) is generally identified by changes in projectile point forms, but the period is also distinguished by broader changes in assemblage content and patterns of site location that appear to reflect important, although gradual, shifts in other cultural parameters as well.

Middle Archaic material assemblages are characterized by the widespread appearance of ground and polished stone tools, including atlatl weights, grooved axes, and various grinding stones. Although netsinkers appear first during the Early Archaic period, they do not become common until the Middle and Late Archaic periods (Chapman 1977).

In the Little Tennessee River Valley, projectile point morphology, in conjunction with other archaeological data, has been used to refine the Middle Archaic cultural sequence for eastern Tennessee (cf. Chapman 1977; Kimball 1985; Davis 1990). The following phases have been proposed that are identified by associated projectile point forms: Kirk Stemmed (6000-5800 B.C.), Stanley (5800-5500 B.C.), and Morrow Mountain (5500-5000 B.C.). A later and as yet unsampled phase may also be present in the Lower Valley that is represented by Guilford, Sykes, and Halifax type projectile points (Davis 1990:58).

Davis (1990:219) has documented evidence of a settlement shift from the Early through the Middle Archaic periods that is believed to reflect a gradual trend towards de-emphasis upon occupation of the Lower Little Tennessee River Valley. Interestingly, investigations in many other regions in the Southeastern United States have documented a similar cultural "hiatus" during the Middle Archaic period. Compared to earlier cultural periods, fewer projectile points have been found in the Lower Valley that can be associated with the Middle Archaic period. Since projectile point types are used more frequently than any other source of information to identify Archaic period components fewer Middle Archaic sites have been defined in the Lower Little Tennessee Valley. Several alternative explanations are possible, one of which is that numbers of projectile points (and by association, sites) do not correlate directly with the size of human populations from one cultural period to the next. Changes in projectile point morphology may reflect changes in function that are related to shifts in subsistence adaptation. What is traditionally treated as a functionally equivalent "class" of artifacts may, therefore, not be directly comparable from one period to the next. Employing such data to predict changes in the size of human populations over time are probably invalid. Secondly, a decrease in identifiable base camps could also reflect a shift towards more dispersed and smaller settlements involving segmentation of social groups into smaller family units. Such a pattern would conceivably reduce the archaeological visibility of base camp-like sites or at the least produce remains different from a more integrated, sedentary, and larger social complement. A dispersed pattern of sites inhabited by smaller family groups might

fit well with proposed changes in the biotic environment that broadly correlate with the mid-Holocene Hypsithermal climatic interval. Additionally, Chapman (1978) has proposed that climatic factors may have contributed to the obliteration of first terrace landscapes by geomorphological processes, thereby decreasing the number of identifiable Middle Archaic base camps and further reducing the evidence for occupation of the Lower Little Tennessee Valley during the mid-Holocene.

Changes in the distribution and contents of Middle Archaic archaeological remains and sites may have been products of concurrent changes in subsistence patterns. Throughout the southeastern United States large shell midden deposits first appear during the Archaic period. Netsinkers also become common suggesting a general emphasis upon the intensive exploitation of riverine resources. Perhaps more important are incipient domesticates which first appear in Middle Archaic archaeological contexts (Ford 1985; Chapman and Shea 1981). Although evidence for a substantial dependence upon agriculture does not appear until much later in the archaeological record, it is apparent that gradual changes were taking place in the subsistence economy of Archaic period populations that contributed to an increased reliance on the production of food resources and generalized but somewhat concomitant cultural trends including increased sedentism.

Also beginning with the Middle Archaic period is evidence for interregional exchange and the beginnings of complex mortuary rituals, perhaps attaching groups to specific areas through ancestor worship (Chapman 1985b; Charles and Buikstra 1983). Brose (1979) has suggested that the appearance of these traits in the Archaic period represent the beginnings of cultural trends that culminate in the more complex exchange and mortuary expressions associated with Adena and Hopewell in the succeeding Woodland period.

Examination of the available data dating to the Late Archaic period (ca. 3000 to 900 B.C.) reveals that while significant changes occurred in southeastern prehistoric cultures the evidence also indicates a continuum of Archaic lifeways only marginally modified by gradual increases in sedentism and the further development of distinctly regional cultural expressions. This latter trend may reflect increases in regional populations, constriction of group territories and a greater dependence upon an increasingly circumscribed range of environmental resources. During this same period archaeological evidence has been recovered that documents an increasing, although still incipient, dependence upon horticulture. Hunting and gathering of wild resources continued to constitute the primary focus of Late Archaic subsistence activities.

Materially, the Late Archaic period is characterized by a bewildering range of projectile point styles. The significance of this range of variation in terms of function, and in terms of regional or temporal stylistic expression is difficult to assess based on available evidence. The problem is compounded by the tendency for some researchers to formulate phase definitions almost exclusively on the basis of changes in projectile point morphology. In the Little Tennessee River Valley, Chapman (1981) has approached the problem by collapsing much of the observed variability in Late Archaic projectile points into broad and morphologically flexible categories that resemble the projectile point clusters employed by Faulkner and McCollough (1973) in their treatment of the Normandy Reservoir assemblages from the upper Duck River Valley in Middle Tennessee. The advantage of this approach is that the resulting categories possess at least minimally demonstrable significance and therefore some utility, in the absence of more substantiating contextual or functional data. The result was the recognition of two separate clusters of projectile point

categories that are collectively included under the typological headings Savannah River Stemmed and Iddins Undifferentiated Stemmed (Chapman 1981). On a broader, contextual scale, these distinct groupings appear to possess demonstrable chronological significance in the Lower Little Tennessee River Valley and throughout eastern Tennessee. Somewhat distinct artifact assemblages and site distribution patterns have been equated with each projectile point grouping thereby lending additional credence to the formulation of two temporally and culturally distinct phases: the Savannah River Phase and the Iddins Phase.

Only a limited number of Late Archaic components have been adequately examined in eastern Tennessee. These include the Late Archaic component at the Higgs Site (McCollough and Faulkner 1973) and the Iddins Site (Chapman 1981). At the Higgs Site, located on the Tennessee River in Loudon County, excavation of a Late Archaic component produced evidence of a possible structure, along with associated midden deposits and several features, one of which contained the carbonized remains of cultivated sunflower, wild chenopods, and acorns. This component was dated ca. 800-900 B.C. and is interpreted as the remains of a limited seasonal occupation by a single family group (McCollough and Faulkner 1973).

At the Iddins Site in the Tellico Reservoir, Late Archaic remains were concentrated along the apex and backslope of the first terrace fronting the Little Tennessee River. Contiguous and overlapping hearths containing large amounts of fire-cracked rock were encountered along with large numbers of other artifact probably representing discrete activity areas. Although direct evidence of structures was not encountered the distribution of other archaeological remains suggested that these were present and that the site was repeatedly occupied on a seasonal basis by several family units (Chapman 1981). Occupation appears to have occurred during the second millennium B.C. While interpreted as the remains of a base camp, activities appear to have been particularly focused upon the exploitation of riverine resources. In addition to the remains of natural foods, domesticated squash was also recovered indicating at least a minimal reliance upon cultivated resources.

Woodland Period (ca. 900 B.C. -A.D. 900)

The Woodland period is characterized by changes in technology and/or material culture, ideology, subsistence, social organization, settlement patterns, and trade. Among the most significant changes, in archaeological terms, are the first appearance of locally manufactured pottery, burial mounds, and incipient agriculture. Three subperiods are generally recognized for the Woodland period. These include: Early (900 B.C.-200 B.C.), Middle (200 B.C.-A.D.600), and Late Woodland (A.D.600-900).

Except for changes in material culture, Early Woodland period archaeological remains are largely inseparable from the preceding Late/Terminal Archaic period. Fully developed, distinctly Woodland period cultural manifestations such as Adena and Hopewell, while traditionally perceived of as radical and complex departures from the foregoing Archaic period, are now considered by many researchers to possess developmental roots that extended well into the Archaic period (Willey 1966). Brose (1979) suggests that the establishment of long-distance and complex interregional exchange which appears to have been an integral component of Adena and Hopewell cultures actually began developing in the Middle and Late Archaic periods. Domesticated plants that were thought to be exclusively associated with the Middle Woodland and succeeding cultural periods are now documented from Late and even Middle Archaic contexts

(Bowen 1977; Chapman and Shea 1981; Cowan et al. 1981; Marquardt and Watson 1976). The greater time depth that has been recently ascribed to cultural trends and patterns that were once thought to be distinctly Woodland period traits would appear to indicate that the distinctions between the Archaic and Woodland periods do not represent absolutes, but are component parts of a continuum of indigenous cultural development. The concept of a "Terminal Archaic" period as employed by some researchers would certainly seem to emphasize the continuity expressed in the archaeological record and the inadequacy of traditional analytical constructs such as "Archaic" and "Woodland" to accurately describe the true nature of cultural change.

As noted above the distinction between the Archaic and Woodland periods is necessarily a grey area since the "transition" between these two broad periods appears to be part of a continuum of gradual change. Faulkner and Graham (1966) referred to this transition as a "shadow zone." The distinction between these two periods is often predicated upon the appearance of ceramic vessels. In the Middle South, fiber-tempered ceramics first appear in the Middle Tennessee River Valley, ca. 1200 B.C. (Walthall 1980). Fiber-tempered ceramics are uncommon in the Upper Tennessee River Valley. One sherd was recovered by investigations in the Nickajack Reservoir (Faulkner and Graham 1966) and a single sherd was recovered from the site of Hiwassee Old Town (Riggs et al. n.d.). In the adjacent Appalachian Summit region the Swannanoa Phase (ca. 700/600 B.C. to 200 B.C.) corresponds to the Early Woodland period (Keel 1976). In eastern Tennessee the earliest Woodland Phase is Watts Bar which has been defined primarily on the basis of quartz-tempered ceramics (Kimball 1985).

A late Early Woodland period Watts Bar phase component was identified and extensively sampled at the Higgs Site (40LO45), located on the Tennessee River in Loudon County (McCollough and Faulkner 1973). Structural remains and associated activity areas comprised of features and midden with artifacts were found within one area of the site. Information obtained from excavation of an earlier component at the site led McCollough and Faulkner (1973) to conclude that "small house areas were viewed and used as definite foci for most activities carried out on the occupation site; the same appears to be the case for Terminal Archaic utilization of the site." This conclusion may further demonstrate the continuity in patterns of adaptation between the Archaic and Woodland periods in eastern Tennessee. Associated with the Watts Bar phase are quartz-tempered ceramics of the Watts Bar Series defined by Lewis and Kneberg (1957). Watts Bar archaeological remains have also been sampled at the Bacon Bend Site where a date of 480 B.C. was obtained (Salo 1969). Aside from excavations at these sites and a few others in the Lower Little Tennessee River Valley little information is available on this portion of the prehistoric sequence in Tennessee.

Throughout much of southeastern North America the Middle Woodland period (ca. 200 B.C.-A.D. 600) is marked by evidence in the archaeological record for increased mortuary ceremonialism and interregional exchange of exotic goods. Changes apparently also occurred in social/political and economic spheres as individuals or groups became integrated into the pan-regional Hopewell Cultural Sphere (Caldwell 1964; Griffin 1967). In east Tennessee evidence of Hopewell Cultural influences have been documented at the Ice House Bottom Site (40MR23) on the Lower Little Tennessee River (Chapman 1973; Cridelbaugh 1981). In addition to the occurrence of non-local ceramics from the Ohio region and blades made from exotic cherts, it has been postulated that the Ice House Bottom Site functioned as a link in a chain of Middle Woodland interaction that may have involved the exchange of mica and other material goods (Chapman and Keel 1979). Other Middle Woodland Hopewell sites near the project area that have been investigated include the

Tunacunnhee Site, located near Chattanooga in northwest Georgia (Jefferies 1976) and Garden Creek Mound 2, in the Appalachian Summit region of North Carolina (Keel 1976).

In east Tennessee the Middle Woodland cultural sequence has been redefined by Kimball (1985) based upon a synthesis of data generated primarily by investigations in the Lower Tennessee River Valley. Two Middle Woodland phases are now recognized. The earliest Patrick Phase (ca. 200 B.C.-300 A.D.) is characterized by a high occurrence of limestone-tempered fabric marked ceramics and large triangular (Copena-like) projectile points. This phase subsumes an earlier Longbranch phase that was initially defined by McCollough and Faulkner (1973) based on investigations at the Higgs and Doughty Sites on the Tennessee River in Loudon County. The Patrick Phase is best known from excavations at the Patrick Site in the Little Tennessee River Valley (cf. Schroedl 1978b).

The latter part of the Middle Woodland period in east Tennessee has been assigned to the Ice House Bottom Phase (ca. A.D. 300-600) (Kimball 1985), which subsumes the previously constructed Candy Creek and Connestee Phases proposed by Chapman (1973) and Cridlebaugh (1981). This phase is distinguished from the preceding Patrick Phase by an increase in simple stamped and complicated stamped pottery. Limestone-tempered and sand-tempered ceramics tend to co-occur in large numbers at sites in east Tennessee that date to the latter part of the Middle Woodland period. Infrequent occurrences of exotic ceramic vessels are also a distinguishing characteristic of late Middle Woodland sites. Some ceramic vessels were imported from northern Georgia and as far away as the Ohio River Valley. In addition, some sites such as Ice House Bottom, exhibit evidence indicative of participation in long-distance Hopewell exchange (Chapman 1973; Cridlebaugh 1981; Kimball 1985).

An additional characteristic of the Middle Woodland period is evidence for an increased reliance on agricultural resources. While archaeological evidence for incipient forms of agriculture extends into the preceding Archaic period, new and more intensive varieties of domesticates first appear during the Woodland period. Corn (*Zea mays*) (dating to the late Middle Woodland) appears in the archaeological record for the first time in the Southeast (Yarnell 1989:50) alongside a number of early Middle Woodland domesticates such as sumpweed (*Iva annua* L.), sunflower (*Helianthus annuus* L.), and squash (*Cucurbita pepo*) (Yarnell 1976:270-271).

In east Tennessee and in the adjacent Appalachian Summit region the Late Woodland period (ca. 600 A.D.-900 A.D.) is poorly documented in the archaeological record. No definite phases have been defined and few habitation sites have been identified or investigated. Chapman (1985a) and Dickens (1976) have suggested that a failure to associate diagnostic material remains with this period may be responsible for the apparent absence of archaeological sites. The emergence of Early Mississippian cultures within the region from a potentially indigenous Late Woodland base would seem to argue against a population hiatus for the region between ca. 600 A.D. and 900 A.D. Based upon information derived from excavation of burial mounds and a transitional Late Woodland/Early Mississippian component Schroedl (1978a; et al. 1985) concluded that "Internal Late Woodland period cultural change best explains the development of Early Mississippian period culture" in east Tennessee (1978a:199).

The best documented, but probably least understood aspect of the Late Woodland period is the Hamilton Focus (Cole 1975; Lewis and Kneberg 1941; Schroedl 1978b). This cultural construct is known almost entirely from mortuary contexts. Associated domestic sites are almost completely

unknown. Many of the so-called Hamilton Focus burial mounds were excavated in the late nineteenth century and the resulting data is of limited application to present archaeological objectives. In the 1970s the University of Tennessee excavated five Hamilton mounds at the McDonald Site (40RH7) (Schroedl 1978b). This information, combined with the investigation of the transitional Late Woodland/Early Mississippian component at Martin Farm (Schroedl et al. 1985) provides the clearest picture of Late Woodland culture currently available from eastern Tennessee. It is clear from this research that most of the cultural patterns observed in the archaeological record for the Late Woodland period persisted into the Early Mississippian period.

Mississippian Period (ca. A.D. 900-A.D. 1600)

In eastern Tennessee more Mississippian period sites have been investigated than those associated with any other cultural period. A long-standing obsession with the exotic and aesthetically attractive material cultural remains that are often associated with Mississippian sites has resulted in the accumulation of massive amounts of variably useful information beginning with the nineteenth century excavation of numerous mound sites. Mississippian remains also tend to be better preserved and archaeologically more visible than the remains of earlier cultural periods, in part because of the lesser amount of time depth involved, but also due to the sedentary structure and cohesive nature of Mississippian period settlement and sociopolitical organization. Despite the archaeological emphasis upon Mississippian remains many facets of Mississippian culture remain poorly understood or documented. This deficiency is due to a traditional emphasis upon the investigation of large, exotic sites at the exclusion of smaller, dispersed settlements and isolated hamlets.

Mississippian cultures are often regarded as having achieved the greatest sociocultural and political complexity in North America north of Mexico. The most outstanding trait is a dependence on horticulture for its subsistence base. Such an adaptation correlates with territoriality and competition for arable land, the production of surplus, population growth, occupational specialization, trade, and complex rituals, to an extent unseen in the region before the Mississippian period. This cultural tradition developed in the Mississippi Valley and spread throughout much of the Southeast by means of migration and diffusion. The term "Mississippian" is used to refer to certain prehistoric populations in the Eastern Woodlands who display specific material culture traits such as shell-tempered pottery, characteristic projectile points, and pyramidal mounds. Smith (1978:486) describes Mississippian populations as those "existing in the eastern deciduous woodlands during the time period A.D. 800-1500 that had a ranked form of social organization, and had developed a specific complex adaptation to linear, environmentally circumscribed floodplain habitat zones" involving the practice of maize horticulture as well as the utilization of a number of wild plants and animals.

The Mississippian horticultural complex consisted of several varieties of maize, squash, pumpkin, gourd, sunflower and beans. These were supplemented by an assortment of wild plant and animal foods. Extensive exploitation of animal species is documented at Mound Bottom (40CH8), located on the Harpeth River west of Nashville, where evidence for the consumption of some 38 different animal species was found. Sixty different species, including mollusks, were represented in excavations at the Stone Site (40SW23) in the Lower Tennessee-Cumberland region (Anderson 1995:16).

Many of the larger Mississippian centers were fortified by defensive stockades encompassing large areas (cf. Clay 1976). These sites are considered the main focal point of Mississippian populations and the residence of elites. Mississippian mortuary patterns indicate a ranked society with each individual having a position in the hierarchy, and differential access to resources and power. The organization of major centers and the distribution of certain classes of artifacts found within them tends to support this model. The focal point of the major centers was a large open plaza that was bordered by flat-topped mounds. These were the substructures for various buildings which probably served both civic and religious functions as well as being the residence of the elites of Mississippian society. The bulk of the population lived in small wattle-and-daub structures with thatched roofs, dispersed outside of the center with which they had some sort of reciprocal relationship.

Mississippian ceramics are far more diversified than those of the prior Woodland periods. Tempering is predominantly shell, followed by grog, in frequency. Effigy wares appear modeled in the forms of both human and animal shapes, while others are painted with decorative elements. Utilitarian wares, used for the storage and preparation of food, are also present.

The large centers are also considered to have been the nexus of a trade network that dealt with the exchange of both exotic and utilitarian items—chiefly salt, copper, and various chert types. Copper and exotic cherts were often used for the production of special "ceremonial" items. In addition, the ideology of the culture, is also portrayed in the symbolism engraved, painted, and sculpted in other materials, such as shell, wood, copper, and stone.

The major focus of Mississippian culture was in the central Mississippi Valley between St. Louis, Missouri and Vicksburg, Mississippi. Three distinct, but mutually interdependent centers of Mississippian activity have been defined. These are: 1) the central Mississippi Valley which includes Cahokia, the largest known Mississippian site, located near East St. Louis, Illinois; 2) the Tennessee-Cumberland drainage area; and 3) the Caddoan area of eastern Oklahoma, Texas, and Louisiana. The Mississippian cultural climax occurred in these areas between A.D. 1200-1500, and its disappearance is generally dated to the beginning of the historic period, ca. A.D. 1700 (Walthall 1980).

The cultural chronology developed by Lewis and Kneberg (1941, 1946) for the Mississippian period of eastern Tennessee was divided into three parts. The initial Hiwassee Island component was considered to date between A.D. 1000 and A.D. 1200. The chief-cultural phases of the late Mississippian period, A.D. 1200-1600, consisted of an earlier Dallas component, followed by a later Mouse Creek phase which existed through the time of European contact. This was followed by a Cherokee period, A.D. 1700-A.D. 1838. The chronology for east Tennessee has been revised as a result of more recent research. A newer chronology consists of a Mississippian I period (A.D. 900-1000) associated with what is known as the Martin Farm cultural phase, Mississippian II (A.D. 1000-1300) also known as the Hiwassee Island phase, Mississippian III (A.D. 1300-1600) associated with both the Dallas and Mouse Creek cultures, and Mississippian IV (A.D. 1600-1838) or the Overhill Cherokee/Historic period (Kimball 1985; Schroedl et al. 1990).

Investigations at Martin Farm, along with additional comparative studies in the lower Little Tennessee River Valley, have contributed to a greater understanding of the emergence of Mississippian culture in east Tennessee (Schroedl et al. 1985; Schroedl et al. 1990). Schroedl choose to emphasize demographic and economic variables in explaining the transition from the

Woodland to Mississippian periods, as evidenced by agricultural intensification and increased settlement size accompanied by greater social stratification.

The initial Mississippian cultural unit (Mississippian I) in east Tennessee is now called the Martin Farm phase and dates from A.D. 900 to A.D. 1000 (Kimball 1985; Schroedl et al. 1985; Schroedl et al. 1990). Martin Farm ceramics are predominantly shell-tempered plain (35-40%), limestone-tempered plain (30-35%), and limestone-tempered cord marked (20-25%) (Schroedl et al. 1985:243; Schroedl et al. 1990:185). Limestone-tempered vessels with loop handles also occur in the Mississippian I ceramic assemblage.

Once considered anomalous (Salo 1969; Schroedl 1978a), the Mississippian I component of the Martin Farm Site (40MR20) is now known to occur at a number of sites in the lower Little Tennessee River Valley (Schroedl et al. 1990:Figure 70). In addition, a Mississippian I component has been recognized at Hiwassee Island (cf. Lewis and Kneberg 1946), and probably also at the Hixson, Sale Creek, Dallas, and Davis sites in the Chickamauga Basin. The ceramic assemblage of the Lea Farm Site (40AN17) (Griffin 1938) in the Norris Basin also suggests a Mississippian I component (Schroedl et al. 1990:188).

Material manifestations of the Martin Farm phase include "shell- and limestone-tempered pottery, Mississippian style structures, and the earliest evidence for temple mounds in the region" (Schroedl et al. 1990:188). The chief technological difference between the Martin Farm and the later Hiwassee Island culture is the expanded and refined use of shell-tempered pottery (Schroedl et al. 1990:188). Major social and economic changes, however, are also indicated by the shift in settlement location, accompanied by increasing size and complexity. Based on radiocarbon dates, it is assumed that these changes occurred relatively rapidly, probably in less than one-hundred years (Schroedl et al. 1990:189, Table 21).

Greater ceramic diversity is demonstrated in the Mississippian II or Hiwassee Island assemblage (A.D. 1000-A.D. 1300) (Schroedl et al. 1990:185). Shell-tempered plain (65-85%) comprises the greater part of the Hiwassee Island ceramic assemblage, followed by cord marked (1-15%), fabric marked (3-5%), and red-filmed (1-3%) sherds, limestone-tempered plain (5-11%) and cord marked (3-6%), with limestone-tempered handles absent. Though shell-tempered types are dominant, limestone-tempered ceramics continue to be well represented (Schroedl et al. 1990:185).

Examination of stone artifacts revealed no differences in the lithic assemblages of Mississippian I and II components, with the characteristic projectile points for both being small triangular Hamilton, Madison and incurvate blade types (Schroedl et al. 1985:248-368; Schroedl et al. 1990:185-186).

Subsistence patterns also appear to show little change between Mississippian I and II at Martin Farm. Faunal assemblages are similar, both demonstrating extensive exploitation of aquatic habitats as indicated by the number and diversity of mollusk, fish and turtle remains.

Terrestrial species represented in the assemblage of both occupations include deer, raccoon, and squirrel (Bogan and Bogan 1985:369-410). The Martin Farm faunal assemblage is similar to that from other Mississippian sites including Jones Ferry (40MR76) (Bogan and Bogan 1985).

The botanical assemblage reveals essentially no variation between Mississippian I and II at Martin Farm, with hickory nut shell, acorn shell, walnut shell, and maize (both eight- and ten-rowed varieties) all represented in comparable amounts. Squash, gourd, chenopodium, sunflower, smartweed, and sumpweed also form parts of both assemblages (Schroedl et al. 1985:411-456). Subsistence patterns at Martin Farm during Mississippian I and II, in general, resemble those documented from other Mississippian sites in the lower Little Tennessee River Valley (Schroedl et al. 1985).

Mississippian II or Hiwassee Island phase occupations have been documented at 30 sites in the lower Little Tennessee River Valley (Schroedl et al. 1990:188, Figure 70). Platform mounds have been found at Martin Farm (40MR20), Mayfield (40MR27), Toqua (40MR6) and Bat Creek (40LD24), and the earliest stages of mound construction at Citico (40MR7) and Bussell Island (40LD17) may also date to Mississippian II occupations.

The Mississippian II period is marked by a shift in residence away from the alluvial floodplain to higher ground. Additional characteristics distinguishing the Mississippian I and II periods include increased site size, complexity, and sedentism. The higher river terraces are strategically protected from periodic flooding, and are thus more favorable for permanent settlement. Further, this tendency to move settlement off the rich bottom soils of the first terrace may indicate increasing competition for agricultural lands prompted by population growth (Schroedl et al. 1990:188).

The Late Mississippian Dallas phase (A.D. 1300-1600) left the most visible physical remains of all the prehistoric cultures of eastern Tennessee. Each of the largest sites, such as Citico, Toqua, and Bussell Island, covered several acres with one or more platform mounds. These were surrounded by thick midden deposits formed by the accumulation of domestic debris from these densely occupied villages. Further characteristics of Dallas material culture include platform mounds with associated plazas; evidence of one or more palisades along the site perimeter; rectangular houses of single-post construction; shell-tempered pottery with chiefly plain and cord marked exteriors, strap and lug handles, and decorations consisting of incising or modeling; and flexed pit burials usually accompanied by grave offerings consisting of small pots or other grave goods (Lewis and Kneberg 1941, 1946). The Dallas lithic assemblage resembles those of Martin Farm and Hiwassee Island phases, with the addition of excurvate triangular projectile points and celts (Davis 1990:61).

The Dallas settlement pattern is characterized by the distribution of compact towns along major alluvial bottom land systems within the Valley and Ridge physiographic province. The majority of Dallas towns have a single substructure mound topped by a single primary structure, and only a few towns such as Toqua (40MR6) have more than one structure on a mound or more than one mound (Polhemus 1987:1246). At least 50 archaeological sites with Dallas components have been identified (Polhemus 1987:Figure 13.5).

Subsistence patterns during the Dallas phase are similar to those of other Mississippian groups. However, it was noted at Toqua that the remains of the most productive cuts of meat tended to be concentrated in high status areas, implying differential access to food (Bogan and Polhemus 1987:992). In addition, certain species of birds and small animals were found in high status burials, suggesting that these animals represented specific totems (Polhemus 1987:1229).

The subsequent Mouse Creek focus (ca. A.D. 1400-1500) was defined by Lewis and Kneberg (1941, 1946) during their work in the 1930s in the Chickamauga Basin as a brief occupation dating to the fifteenth century and corresponding to the historic Yuchi group (Lewis and Kneberg 1946:13-14, 1952:198). Radiocarbon dating has since confirmed this chronological placement (Sullivan 1987:17-18).

According to Lewis and Kneberg (1946:14) the floors of Mouse Creek structures were excavated 18 to 24 inches below ground surface and the walls were banked with clay. Mouse Creek communities were often palisaded and had large community structures but no substructure mounds. Pottery was shell tempered, but in contrast to the Dallas ceramic assemblage, the occurrence of cord marked surface treatment is minimal. The dead were buried in a fully extended position, as opposed to the semi-flexed position of Dallas burials (Lewis and Kneberg 1946:14).

The Mouse Creek ceramic assemblage resembles Dallas in that shell-tempered plain sherds predominate with virtually all the decorations and surface treatments found in the Dallas assemblage represented. However, the frequencies of cord marked, fabric marked, red painted, and complicated stamped surfaces sharply decrease, while the frequencies of plain and decorated (all motifs) increase. The number of grit-tempered sherds, of all surface treatments, also increase (Qualla types). Shell-tempered Overhill check stamped and complicated stamped begin to show up in the Mouse Creek assemblage in contexts that are presumably late prehistoric or early contact period. Further characteristics include the usage of strap and lug handles (Kimball 1985:145; cf. Lewis and Kneberg 1941, 1946).

The relationship between Mouse Creek and Dallas phases is unclear. Though there is some evidence to suggest that Mouse Creek existed between Dallas and the Historic period (Schroedl 1986; Sullivan 1989:60), there is also some indication of contemporaneity since it appears that the Dallas culture continued uninterrupted well into the historic period in some areas such as Toqua (40MR6) (Polhemus 1987). The spatial boundaries of the Mouse Creek phase are unclear, though it has been reported as occurring along the lower Hiwassee River and on the main channel of the Tennessee River in southeastern Tennessee (Sullivan 1987:19). As mentioned above, Lewis and Kneberg considered Mouse Creek to be equivalent to the historic Yuchi described by Charles Hicks as "neighbors of the Cherokee" (C.C. Hicks to J. Ross, letters, February to July 1826, Ayers Collection, Newberry Library, Chicago. Photostat copies, McClung Historical Collection, Lawson McGhee Library, Knoxville [McClung Collection MS/970.3]); Lewis and Kneberg 1946:13-14). The Yuchi remained along the Hiwassee River until 1714 when the Yuchi of Chestowa were destroyed by the Cherokee. Following this they abandoned the area and were absorbed by the Creek nation (Lewis and Kneberg 1946:14).

Protohistoric/Historic Period (ca. A.D. 1600-A.D. 1838)

Southern Tennessee was occupied by the Overhill Cherokee during the historic period (A.D. 1600-1838). In contrast to earlier Mississippian cultures, the Cherokee were an egalitarian society organized at the tribal level with the center of political focus at the town or community (Riggs et al. n.d.:4). The exact relationship between the Overhill and Dallas phases is still disputed, though Dickens (1976) considers them to be related and Kimball (1985:292) treats the Overhill Cherokee occupation of the Tellico reservoir area as a terminal Mississippian complex. Polhemus, on the other hand, found evidence for a lack of continuity between Dallas phase and Overhill phase occupations at Toqua (40MR6) (Polhemus 1987:1253).

There have been extensive excavations at sites with Overhill components, including those at Tomotley (Baden 1983), Toqua (Polhemus 1987) and Chota-Tanasee (Schroedl 1986). Additional, less-intensive investigations have been conducted at Wear Bend (Chapman 1980), Citico (Chapman and Newman 1979), Tuskegee (Guthe and Bistline 1978) and Mialoquo (Russ and Chapman 1983).

Overhill phase structures, as described by eighteenth century observers and as documented through archaeology, consisted of vertical-post construction with both summer and winter houses. Large townhouses were constructed at major villages, which generally followed a more dispersed, less consolidated pattern of settlement than the often palisaded and more compact Dallas phase villages (Polhemus 1987:Table 13.2).

Overhill ceramics are predominantly shell tempered with some grit and mixed tempers. Smooth and scraped surface treatments are most common with stamped surfaces second in frequency. Cord marking is absent. There are no effigy wares in the Overhill assemblage and incised decoration is rare, as is the presence of handles. Handles that do occur are plugged. Compared to the Dallas ceramics there is less variation in form, with a tendency toward larger sizes. Vessel forms include jars, both open and closed bowls, and pans (Polhemus 1987:Table 13.2).

The early Historic period is marked by drastic changes in Native American lifestyles. The influence of increasing contact with Euro-American cultures included the adoption of material items, and subsistence and settlement patterns. By 1700, the Dallas culture had either moved further south or been absorbed into other groups while the Cherokee remained in the vicinity of the lower Hiwassee. Qualla-type ceramics, dating between A.D. 1500-1900, continue to be manufactured at historic Cherokee sites. Local clays and tempering agents were employed. Surface treatment included check stamping, complicated stamping, and bold incising decoration (Egloff 1967; Keel 1976:215). European manufactured items such as glass trade beads, iron tools and utensils, guns, glass bottles, and copper kettles are common on Overhill Cherokee sites from the colonial and federal periods in Tennessee (Baden 1983; Coe and Keel 1965; DuVall and Taylor 1977; Guthe and Bistline 1978; Keel 1964, 1976:21-64; Russ and Chapman 1983; Schroedl 1986; Schroedl and Polhemus 1977).

By the time of the Revolutionary War, increasing friction with those of European descent contributed to the dispersal of the Cherokee groups and the abandonment of traditional settlement systems. At the beginning of the nineteenth century, the majority of the Cherokee had abandoned their large villages located on major rivers and settled into dispersed communities of loosely aggregated households and isolated farmsteads. Traditional structure forms were replaced by cabins of horizontal log construction, and intensified farming and livestock production were adopted. Some Cherokee became quite wealthy, owning large homes and slaves. Euro-Americans participated in Cherokee communities conducting trade and operating schools and churches. A process of miscegenation commenced as the two cultural groups began to intermarry (Anderson 1995:20).

Cherokee removal began by the signing of three treaties between 1805 and 1819 which ceded most of the Cherokee land north of the Hiwassee and west of the Tennessee River. This process was concluded in 1836 with the Treaty of Removal which ceded the remainder of the Cherokee lands in Tennessee, North Carolina, and Georgia (Folmsbee et al. 1969).

Settlement in the area of present-day Sevier County was begun about 1783 although for years it had been traversed by traders and military forces operating against the Cherokee. In 1783, a group of settlers organized near the mouth of Dumplin Creek and built a station known as Henry's Station (Goodspeed 1887). The first grist mill was erected in 1783 by Thomas Stockton at Christian's Ford of the French Broad River. Other early settlers included Samuel Wear who built a station on the West Fork of Little Pigeon River near the mouth of Walden's Creek and Isaac Thomas who built his station at the Forks of the Little Pigeon. Some accounts list Thomas as possibly the first settler within the county (Sevier County Heritage Book Committee [SCHBC] 1992). During the following year, settlers built cabins and cleared fields along the Little Pigeon River and Boyd's Creek where they established two strong forts named Newell's and McGaughey's Stations.

Sevierville was laid out in 1795, although a Baptist Church had been established in the immediate area as early as 1789 (Goodspeed 1887). James McMahon was possibly the earliest settler to locate near the present vicinity of Sevierville which was originally known as the "Forks of the Little Pigeon" (SCHBC 1992). Isaac Thomas chose the Forks vicinity as his home and was perhaps the first settler of the county. Thomas built his home as a fort near the forks of the river which served as a tavern and the settlement's first hotel. His fort or station was located near the location of the old railroad depot (SCHBC 1992). The community continued to be called the "Forks of the Little Pigeon" for many years. The county seat was relocated about ten miles from Newell's Station to the Forks of the Little Pigeon in 1795. Three sites had been considered for the town with early settlers Spencer Clack, Isaac Thomas, James McMahon, and others insisting that the Forks area be chosen. The site of Sevierville was located on a 25-acre tract owned by James McMahon. The tract was subdivided and auctioned with the proceeds were used to construct the county's first courthouse and jail. The courthouse in Sevierville burned in 1824 and destroyed the early county records (SCHBC 1992). Apparently the courthouse was replaced by a frame structure which was replaced again in 1850 by a brick structure. On March 26, 1856, the town was visited by fire which almost completely destroyed it and consumed the brick courthouse with all its contents (Goodspeed 1887). The early mills in the area included that of Spencer Clack, located on the right bank of the East Fork and Isaac Thomas, located on the left bank of Little Pigeon (Goodspeed 1887).

ARCHAEOLOGICAL BACKGROUND

Given the apparent abundance of cultural resources in Sevier County, the attention of the professional archaeological community has been directed at compliance surveys for federal or state licensed, permitted or funded projects.

Records maintained by the Tennessee Division of Archaeology in Nashville include a number of manuscripts, reports, and literary works dealing with the archaeology of Sevier County. Many of these have been produced in compliance with cultural resource management laws particularly the Section 106 review process implemented pursuant to the National Historic Preservation Act.

Several sites have been recorded in the vicinity of Sevierville and Pigeon Forge, mostly along the Little Pigeon River and the West Prong of the Little Pigeon River. Sites discussed here will focus on those along the West Prong of the Little Pigeon (Figure 3).

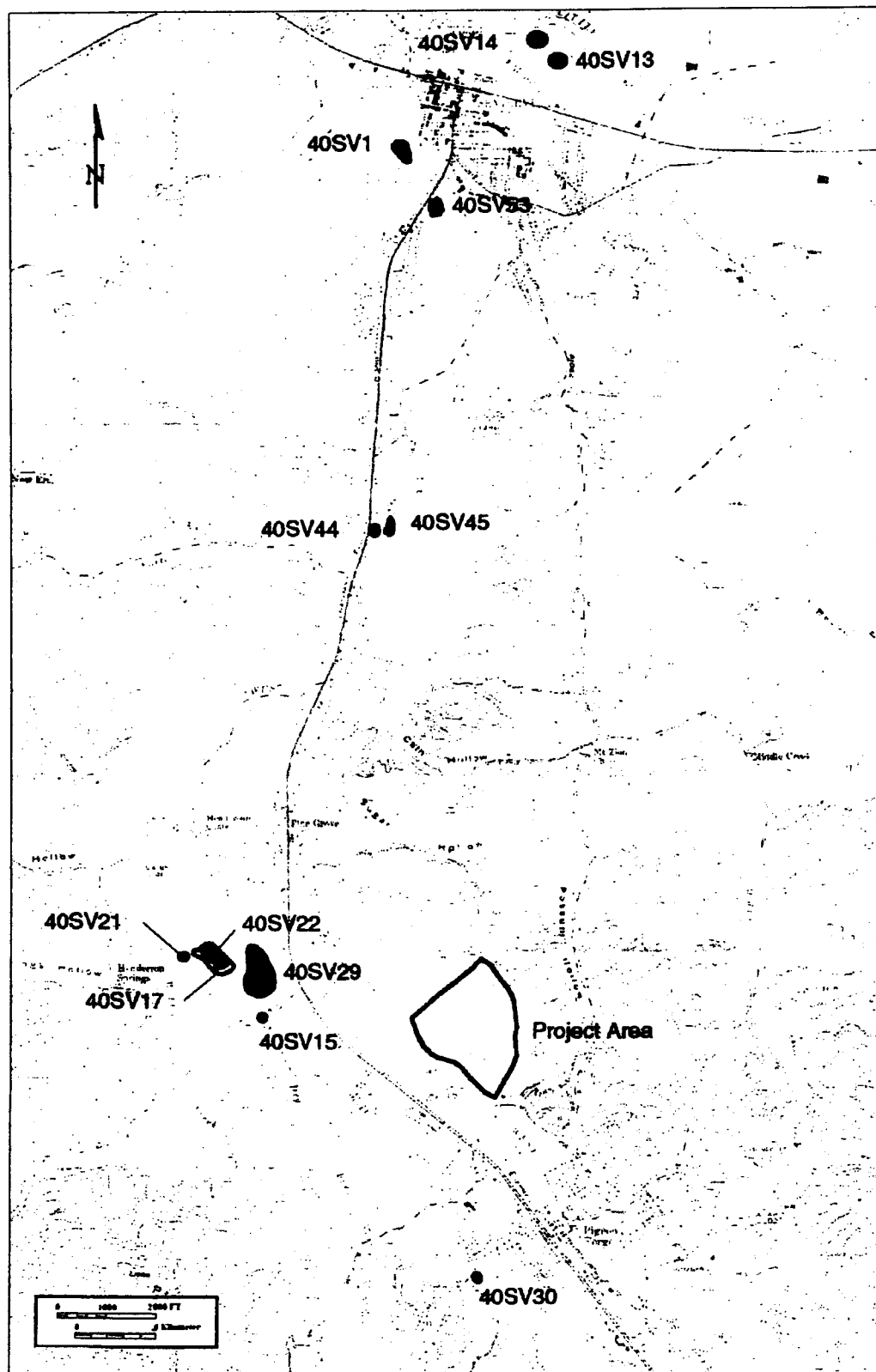


Figure 3. Topographic map showing the locations of previously recorded sites in the vicinity of the project area (Pigeon Forge, Tenn., 156-SE, 1970).

Sites 40SV13 and 40SV14 are both located near the confluence of the West Prong Little Pigeon River and the Little Pigeon River. There is limited data on either of these sites beyond minimal reconnaissance data.

The McMahan Mound Site (40SV1) is a large multicomponent site, located within the city limits of Sevierville. Site records include references to Dallas Phase and Cherokee burials being present on the site, representing both protohistoric and historic occupations. E. Palmer is known to have first excavated on the site in 1881. In 1976, salvage efforts were undertaken at the site (directed by Richard Polhemus), though no formal report of these investigations was published.

Site 40SV53 was recorded on the floodplain of the West Prong Little Pigeon River (DuVall 1996), at approximately River Mile 1.3. The site contained a moderate amount of material including fire-cracked rocks, cobble and lithics. No diagnostic artifacts were recovered.

During 1995, Richard Polhemus of the University of Tennessee investigated two sites, 40SV44 and 40SV45 along the West Prong of the Little Pigeon (River Mile 3.1). Site 40SV44 is located on a terrace remnant. A controlled surface collection from 40SV44 collected approximately 1075 artifacts ranging in age from the Early Archaic through the twentieth century. Site 40SV45 lies immediately east of the site 40SV44 on the crest of a low levee. This site consisted of a scatter of fire-cracked rock with minimal lithic debitage present. No cultural affiliation could be determined for this site.

Five additional sites are located along the West Prong Little Pigeon River approximately 2km west of the current project area. Site 40SV17 is also referred to as the Wear House, Wear's Fort, the Kyker Farm, and Wear's Cemetery. It was occupied during the late eighteenth through the early twentieth centuries. At one point, there were several log structures to be observed on the site. Tennessee Division of Archaeology site files contain substantial information about this important historic site.

Near the confluence of Mill Creek and the West Prong of the Little Pigeon River is a large prehistoric site (40SV21) that contains thick midden deposits which accumulated during the Archaic and Early Woodland periods. The site located on a terrace which is cultivated periodically.

Northwest of Wear's Cemetery, and located on a river terrace, is a site (40SV22) represented by a light to moderate density scatter of early Woodland to Protohistoric cultural materials. Site 40SV29 is another multicomponent site containing evidence of Late Archaic, Middle Woodland and Mississippian period occupations. This site covers several acres.

Site 40SV15 is located northwest of Wear Cove Road on the floodplain of Mill Creek. It is reported as an Archaic Period habitation site.

Site 40SV30 is another site located along Mill Creek, located approximately 1.5km south of the project area. It is recorded as a large scatter of prehistoric artifacts concentrated along the top of a knoll containing material associated with Paleo-Indian, Early-Late Archaic, Early-Middle Woodland, and Mississippian periods.

Reports on file with the TDOA containing references to sites in Sevier County are referenced as Ball (1976), Bass (1977), DuVall (1977), Kline (1983), Taylor (1994), Walker et al. (1985), and

Ward (1985). The report by Bass (1977) covers a broad data base related to the settlement and subsistence throughout the mountain range. Parmalee (1988) conducted an analytical study of mollusks found in the Little Pigeon River system.

METHODS

Background Research

A search of the site files at the Tennessee Division of Archaeology (TDOA), Nashville, was conducted to obtain information on any archaeological sites or historic properties that had been previously recorded within or in close proximity to the project area.

Field Methods

The methodology employed for the archaeological investigation was established to provide a comprehensive assessment of the APE. The evaluation was to include the documentation of any identified site locations, their vertical and horizontal boundaries within the APE, their cultural affiliation(s), and potential to contain intact resources. In addition, the APE was to be evaluated as to its potential to contain deeply buried cultural materials within areas of alluvial and/or colluvial deposition. All areas thought to contain the potential for deeply buried deposits, though not confirmed at the level of this investigation were to be clearly outlined and reported as such.

Field investigations consisted of a pedestrian surface inspection of the entire APE supplemented with shovel test unit excavations. Shovel test units were excavated to determine the subsurface presence of cultural remains and to examine soil stratigraphy. These units were placed at 30-m (98.4-ft) intervals across portions of the APE thought to have potential to contain archaeological remains. Areas of excessive slope and those displaying severe erosion and/or disturbances were not tested. The excavation units measured 30-x-30-cm and were excavated to depths within sterile subsoil (Figure 4). Each test was assigned a sequential numerical designation and their locations were plotted on project maps. The soil stratigraphy exhibited in each test unit profile was measured and recorded as to soil depths, types, textures, contents, inclusions, and color (using *Munsell's Soils Color Charts*). Representative shovel test units were photographed. All displaced soil was screened through 1/4-inch wire mesh to ensure the systematic recovery of artifacts. All cultural material was bagged, labeled with provenience information, and transported to the lab for processing and analysis using local typologies.

Laboratory Methods

Standard procedures for processing artifacts include washing and sorting artifacts into general categories based on raw material and presumed function. No artifacts were recovered as a result of the survey of Management Area A.



Figure 4. Representative photograph of shovel test excavation (T-35, ST-1), view southeast.

RESULTS OF INVESTIGATIONS

A review of the state site files at the Tennessee Division of Archaeology and the Tennessee Historical Commission indicated that no archaeological sites or historic properties had been previously documented within or adjacent to the APE. Sites located within the general vicinity of the APE are concentrated along the floodplain terraces of the Little Pigeon River and the West Prong of the Little Pigeon River (see *Archaeological Background* and Figure 3).

The topography of Management Area A can be characterized as a series of steep upland slopes and irregular narrow ridgetops with minor flat areas. The project area is segregated by two major drainways or hollows extending generally northward into the interior of the tract. Each of the two drainways contained a small stream which exhibited minimal flow. The westernmost drainway terminated in small farm pond which provided water to livestock. The side slopes are extremely steep and approach 2:1 slope.

Any cultivation within the APE would have been very limited. It appears that the tract has served as pastureland throughout its history. Mixed hardwoods are present along the east, north, and west boundaries. Small isolated patches are also present in old fence rows, steep side-slopes, and drainways across the tract. Most of the harvestable timber has been recently cut, as evidenced by skidder roads crossing all sections of the tract. These were especially prevalent along the ridgetops, down the points, and along the outer boundary (Figures 5 through 7). The skidder roads terminated at a large staging area just north of Teaster Lane (Figure 8).



Figure 5. View north along skidder road at east boundary.



Figure 6. View west from eastern boundary along skidder road on a ridge point.



Figure 7. View west of narrow ridge point showing skidder roads.



Figure 8. View east of log-staging area. Teaster Lane is to the right.

The survey focused on the ridgetops and the bottoms of the drainways. Skidder roads were present along all of the ridgetops. These provided excellent survey conditions with surface visibility estimated at 75-80 percent (Figures 9 and 10). Some of the flatter sections along the ridgetops had been utilized as small log-staging areas (Figure 11) with equally good survey conditions.

The drainways were surveyed to determine if any historic period structures may have been located in proximity to the small streams. No evidence of any structures were present in the drainways. Additionally, no benches or flatter points were observed which would have been suitable areas for prehistoric occupation (Figures 12 and 13).

Two areas in the extreme southwest corner of Management Area A contained suitable terrain for occupation. Both of these areas were shovel tested (Figure 14).

A total of twelve shovel tests were excavated within Management Area A. The results of shovel testing are presented in Table 1. Eight shovel tests were excavated on the relatively level field (Figure 15) on the north side of Teaster Lane adjacent to an outlet mall parking lot (Transect Nos. 34 and 35). Shovel testing revealed an average 19.5-cm plowzone (silt loam) overlying silty clay. No artifacts were present in any of the shovel tests.

Four shovel tests were placed on the two knobs on the south side of Teaster Lane (Transect No. 33). Mottled clayey soils containing commercial gravel indicated that these areas had been mechanically disturbed, probably in association with the construction of Teaster Lane.

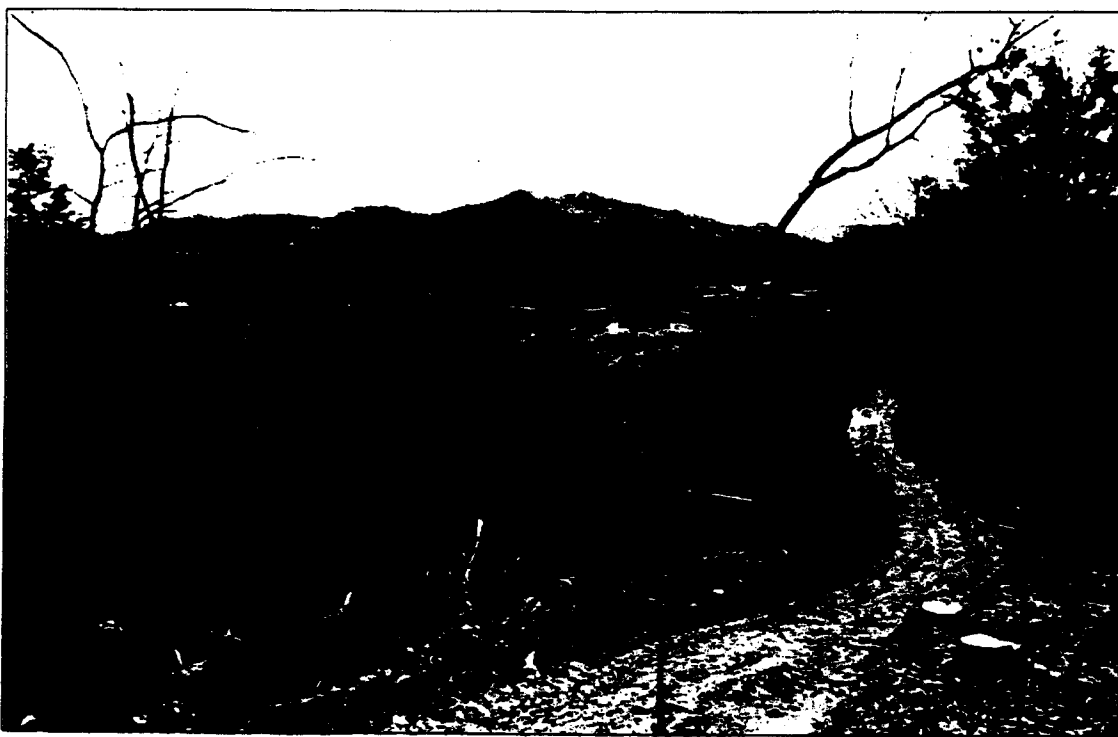


Figure 9. View northwest showing skidder roads on ridgetops.

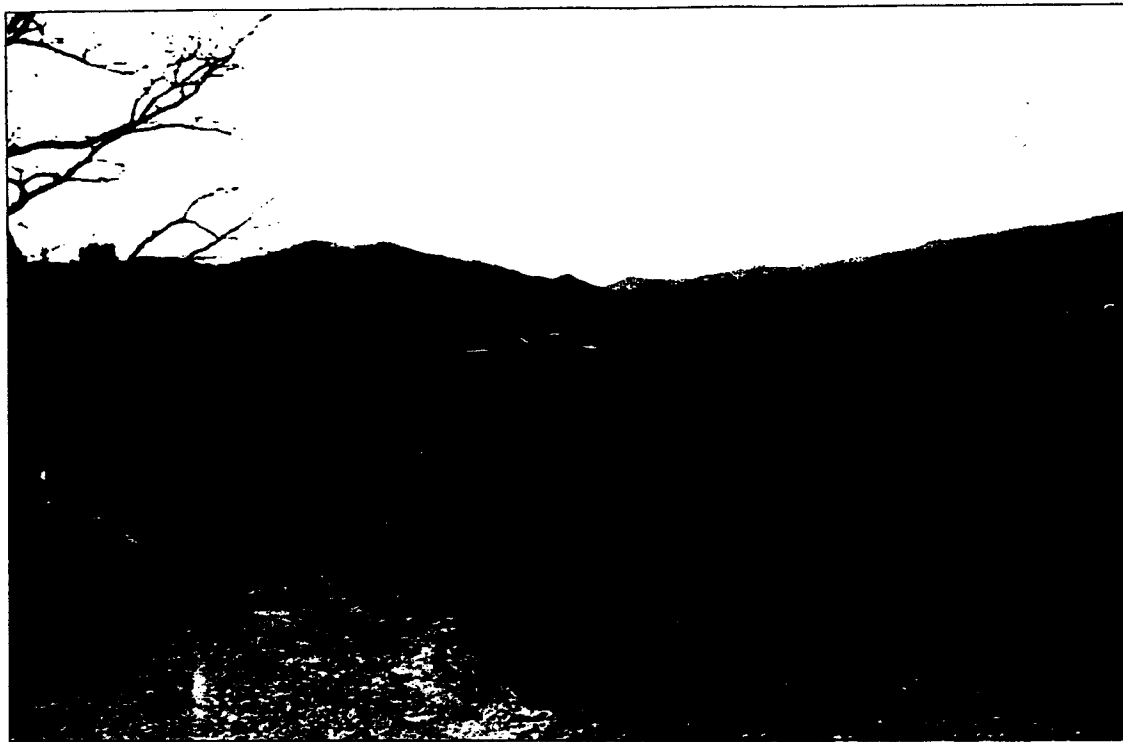


Figure 10. View south showing skidder roads on ridgetops and constricted drainways.

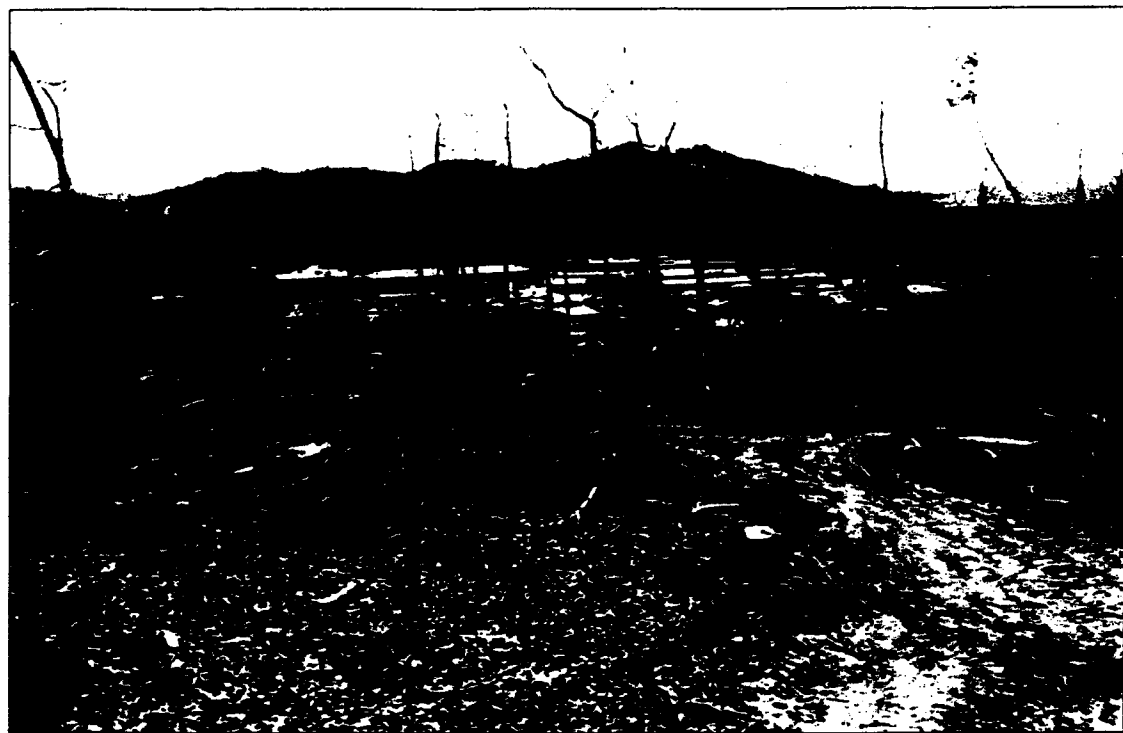


Figure 11. View south of small log-staging area of flats.

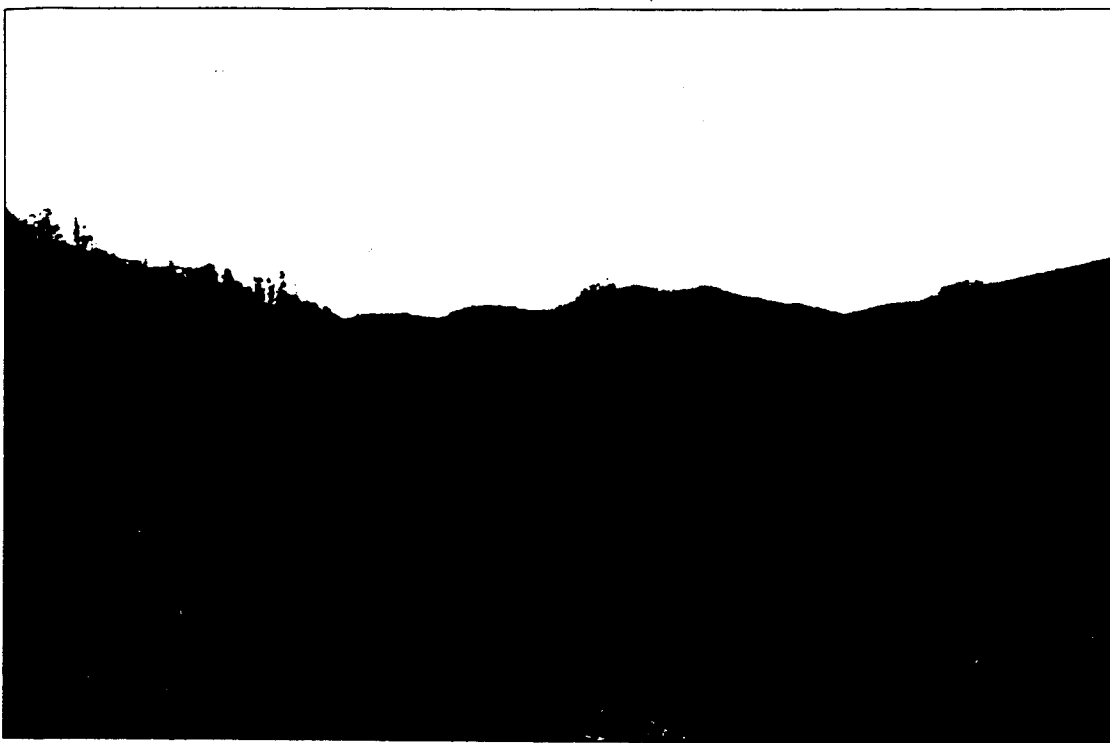


Figure 12. View north of westernmost drainway. Note steep side slopes.



Figure 13. View north of easternmost drainway.

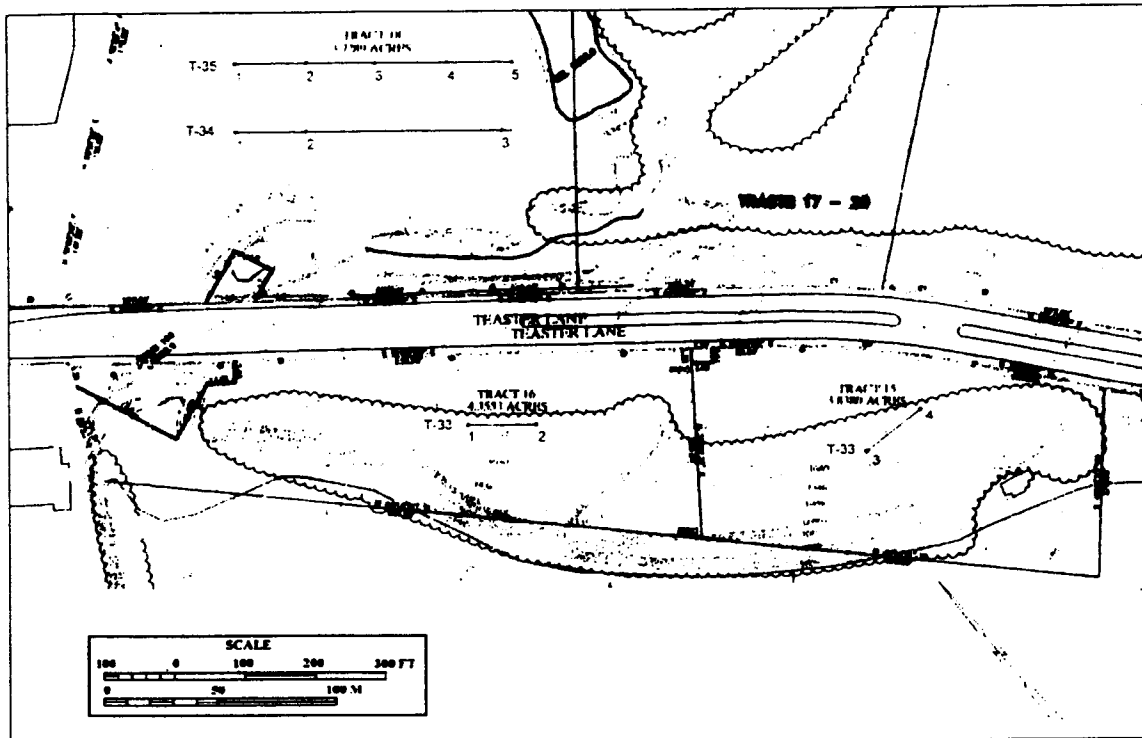


Figure 14. Project map showing portions of Management Area A with suitable terrain for occupation and shovel test transects.



Figure 15. General view southeast along Transect 35 north of Teaster Lane.

Table 1. Management Area A Shovel Test Results

Transect	Shovel Test No.	Level	Depth	Soil Description	Artifacts
33	1	1	0-9+	dark yellowish brown (10YR4/4, 4/6) and yellowish brown (10YR5/6) very compact clayey silt w/ lg amt natural gravel, road gravel, sparse pebbles	0
	2	1	0-15	dark yellowish brown (10YR3/4) compact silty loam with lg amt gravel (disturbed)	0
		2	15+	yellowish brown (10YR3/4) compact silty clay	0
	3	1	0-23	yellowish brown (10YR5/4, 5/6) compact silt loam w/ gravel and a few pebbles	0
		2	23-28	yellowish brown (10YR5/4, 5/6), brown (7.5YR5/4) and strong brown (7.5YR5/6) compact clayey silt	0
		3	28-30	brown (7.5YR5/4) and strong brown (7.5YR5/6) silty clay	0
	4	1	0-28	dark yellowish brown (10YR4/4) compact silt loam w/ gravel (disturbed)	0
		2	28+	yellowish brown (10YR5/6) compact clayey silt	0
34	1	1	0-8	dark yellowish brown (10YR4/4) slightly clayey silt loam w/ sm amt pebbles	0
		2	8-24	dark yellowish brown (10YR4/6) compact silt loam w/ higher concentration of sm-med pebbles	0
		3	24-27+	brownish yellow (10YR6/8) clayey silt, fewer pebbles	0
	2	1	0-10	dark brown (10YR3/3) clayey silt loam w/ med amt of sm pebbles	0
		2	10-21	yellowish brown (10YR5/4, 5/6) silt loam w/ sm amt of sm pebbles	0
		3	21-26+	strong brown (7.5YR5/8) silty clay w/ sm amt of sm pebbles	0
	3	1	0-10	dark yellowish brown (10YR4/4) silty clay loam w/ sm amt of pebbles	0
		2	10-23	dark yellowish brown (10YR4/4) and yellowish brown (10YR5/6) mottled silty clay w/ regolith/manganese	0
		3	23-30	yellowish brown (10YR5/8) and strong brown (7.5YR5/6) silty clay	0
		4	30-32	yellowish brown (10YR5/8) and strong brown (7.5YR5/8) silty clay	0
35	1	1	0-16	dark yellowish brown (10YR4/4) silt loam w/ sm amt sm-med natural gravel	0
		2	16-24+	yellowish brown (10YR5/6) compact silt	0
	2	1	0-13	dark yellowish brown (10YR3/4) slightly sandy silt loam	0
		2	13-19	light yellowish brown (10YR6/4) clayey silt	0
	3	1	0-19	dark brown (10YR3/3) clayey silt loam	0
		2	19-25	light yellowish brown (10YR6/4) silty clay	0
	4	1	0-20	dark yellowish brown (10YR4/4) clayey silt loam	0
		2	20-25	yellowish brown (10YR5/6) silty clay	0
	5	1	0-15	dark yellowish brown (10YR3/4) clayey silt loam	0
		2	15-20	dark yellowish brown (10YR4/4) clayey silt loam	0
		3	20-26	yellowish brown (10YR5/6) silty clay	0

RECOMMENDATIONS

Based on the survey, no historic properties or archaeological sites will be affected in Management Area A. The narrow ridgetops and constricted drainways/hollows provided a very low probability area for both historic and prehistoric sites. Areas with the potential to contain deeply buried deposits were not identified within Management Area A. No additional archaeological investigations are recommended in this portion of the Riverwalk project.

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Appendix G

Tourism Development Zone (TDZ) Map

TOURISM DEVELOPMENT ZONE

CITY OF PIGEON FORGE, TENNESSEE

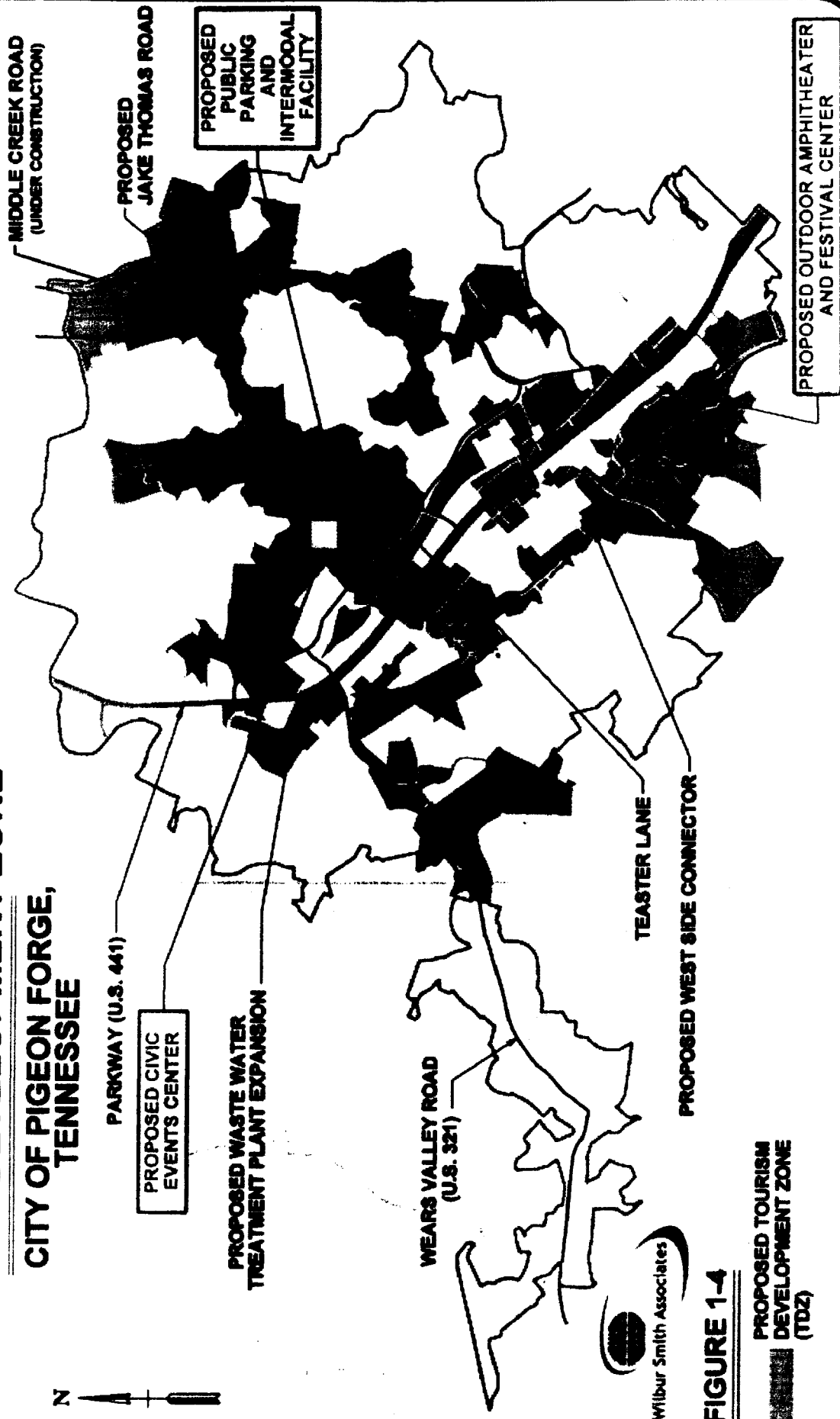


FIGURE 1-4

PROPOSED TOURISM DEVELOPMENT ZONE (TDZ)

Attachment 2

404(b)(1) Guidelines Compliance Checklist

Evaluation of compliance with 404(b)(1) Guidelines (Restrictions on Discharge, 40 CFR 230.10):
(A check in a block denoted by an asterisk indicates that the proposal does not comply with the guidelines.)

• Alternatives test.

Based on the discussions in Section 4, are there available, practicable alternatives having less adverse impact on the aquatic ecosystem and without other significant adverse environmental consequences that do not involve discharges into "WUS" or at other locations within these waters?
[Yes(*)__ No x]

Based on the discussions in Section 4, if the project is in a special aquatic site and is not water-dependent, has applicant clearly demonstrated that there are no practicable alternative sites available?
[Yes x No(*)__]

• Special restrictions. Will the discharge:

- violate state water quality standards? [Yes(*)__ No x]
- violate toxic effluent standards (under Section 307 of the Act)? [Yes(*)__ No x]
- jeopardize endangered or threatened species or their critical habitat? [Yes(*)__ No x]
- violate standards set by the Department of Commerce to protect marine sanctuaries?
[Yes(*)__ No x]

Evaluation of the physical/chemical and biological characteristics and anticipated changes indicates that the proposed discharge material meets testing exclusion criteria for the following reason(s):
[Yes x No __]

(x) based on available information, the material is not a carrier of contaminants

() the levels of contaminants are substantially similar at the extraction and disposal sites and the discharge is not likely to result in degradation of the disposal site and pollutants will not be transported to less contaminated areas

() acceptable constraints are available and will be implemented to reduce contamination to acceptable levels within the disposal site and prevent contaminants from being transported beyond the boundaries of the disposal site

• Other restrictions. Will the discharge contribute to significant degradation of "WUS" through adverse impacts to:

- human health or welfare, through pollution of municipal water supplies, fish, shellfish, wildlife, and special aquatic sites? [Yes(*)__ No x]
- life stages of aquatic life and other wildlife? [Yes(*)__ No x]

- diversity, productivity, and stability of the aquatic ecosystem, such as loss of fish or wildlife habitat, or loss of the capacity of wetland to assimilate nutrients, purify water, or reduce wave energy?
[Yes(*)__ No x]

- recreational, aesthetic and economic values? [Yes(*)__ No x]

• Actions to minimize potential adverse impacts (mitigation). Will all appropriate and practicable steps (40 CFR 230.70-77) be taken to minimize the potential adverse impacts of the discharge on the aquatic ecosystem? [Yes x No(*)__]

The mitigation measures included in the permit application, additional mitigation, general permit conditions, and special permit conditions developed would adequately minimize adverse effects to the aquatic environment.

